THE IRON AGE

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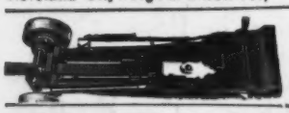
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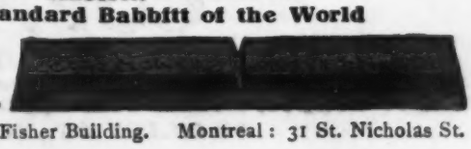
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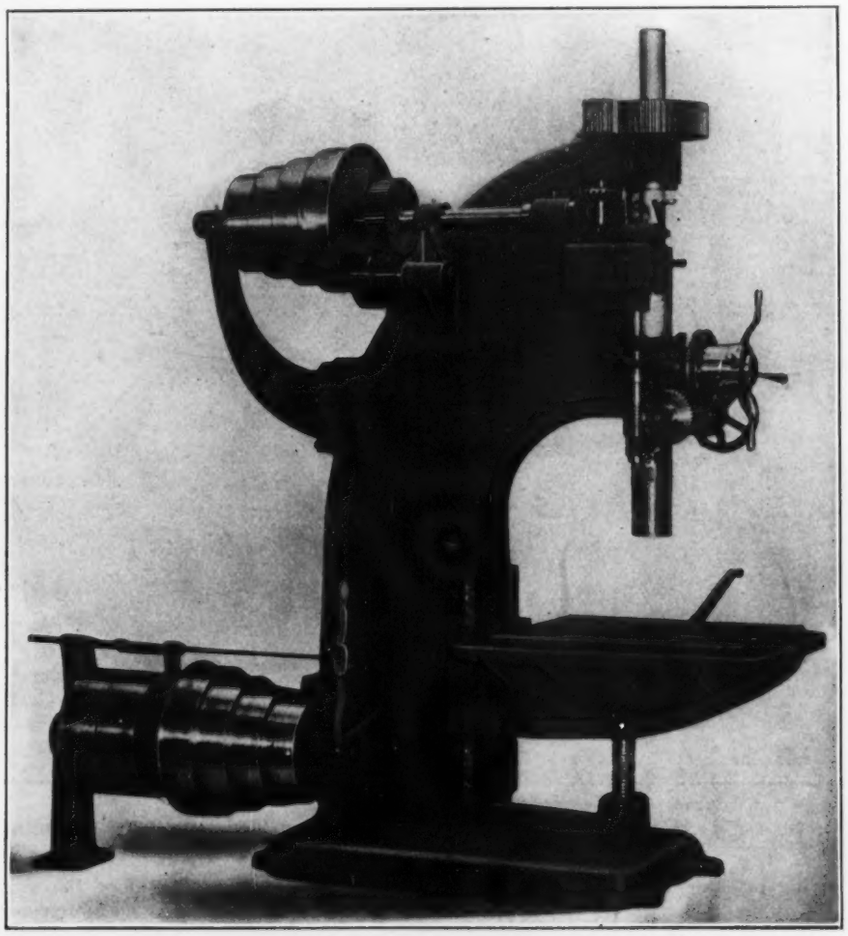
THE IRON AGE

New York, Thursday, April 2, 1908.

A New Foote-Burt High Duty Drill.

Extreme rigidity and powerful driving mechanism are the important features of the No. 26 high duty drill now being manufactured by the Foote-Burt Company, Cleveland, Ohio. The machine is guaranteed to drive a 3½-in. high speed steel drill to its full cutting capacity. All parts, moving and stationary, are designed with a large factor of safety and on the basis of much greater stresses than were ever anticipated in the construction of the old time drilling machine, intended only for driving the ordinary tool steel drills. The effect is particularly noticeable in the massiveness of the frame and its weight and in the wide faced gears which transmit the spindle drive. The machine as illustrated is built with two depths of throat, capable of drilling, respectively, to the centers of 44 and 60 in. circles, and is supplied either with a straight drive countershaft, as shown, or with a right-angle drive. Another option is the provision of a compound table for the plain table.



The New No. 26 High Duty Drill Built by the Foote-Burt Company, Cleveland, Ohio.

The spindle is of forged high carbon steel, 3½ in. in diameter in the sleeve and 3⅜ in. in the upper section. The nose of the spindle is fitted with a No. 6 Morse taper socket. The spindle is counterbalanced by a weight inside of the column connected by chain with the top of the sleeve. The sleeve is 23 in. long, 5¼ in. in diameter, and has ball bearing thrust collars of the company's own make, using ¾-in. balls, and is warranted to withstand the hardest continual service without breakage of balls or crushing out of collars.

Three changes of speed are provided through the change gear mechanism located at the side of the spindle which are instantly made by shifting the lever over the gear box. The box works on the pull pin, as distinguished from the sliding key principle. Any particular combination of gears is made active by the entering of a lock bolt through the shaft in a hole in the gears, when the shaft is shifted to its various positions by a rack and pinion connection with the operating lever. The device is positive, simple, and has been used satisfactorily for a number of years in other of the company's products. While the cut is being taken the mechanism may be engaged or disengaged without danger or injury. In addition to the power feed, hand feed through worm and worm wheel and quick return by the pilot wheel are provided after the usual custom in drilling machines, and all of these are within easy reach of the operator from the working position.

The feeds are also provided with automatic stops, which operate the knockout controlled by the horizontal lever projecting toward the front immediately behind the quick return pilot wheel. This lever is also so connected with the frame as to make a positive stop when so desired. The feed mechanism is disengaged for the operation of the quick traversing movement by a pin clutch controlled by the pilot wheel handles, which are swiveled. By pulling this member out the worm connecting this part of the clutch and the feed shaft is disconnected and a direct connection made between the pilot wheel and the pinion meshing in the rack on the spindle sleeve.

The drive is simply transmitted, as is clearly indicated in the illustration. Four speeds are provided through the four-step cone pulleys, and these are in turn doubled by the back gears. With the countershaft running at 300

rev. per min. and the back gears in, the speeds of the spindle are 23, 30, 38 and 50 rev. per min., and with the back gears out, 80, 103, 153 and 170 rev. per min. The miter gears, which transmit the drive from the upper horizontal shaft to the vertical parallel shaft connecting with the spindle, are of forged steel with plain teeth.

The table is fitted to the column by a square locked slide and is clamped by straps. Additional support is given underneath by the 3-in. square thread screw which is used to elevate the table, although during operation this performs the important function of a solid jack beneath the table in the line of the spindle. The table is provided with a large oil groove and has a working surface inside of the groove, 26 x 34 in.

Following are the other more important dimensions: Maximum distance from the spindle to the top of the plain table, 32 in.; distance from the center of the spindle to the face of the column, 22 or 30 in.; range of spindle movement, 16 in.; feeds, 0.7, 0.016, 0.32 in. per revolution; weight of 44-in. swing machine, 6000 lb., and of 60-in. swing machine, 6800 lb.

The company also builds a No. 25 high duty drill, which is capable of driving a 2¼-in. high speed steel drill to its maximum capacity. It is made in two patterns, with 24 and 36 in. swings, respectively.

The Toronto Testing Laboratory, Ltd., has been incorporated and has established an office in the Saturday Night Building, Toronto, Canada. This is a company of analytical and consulting chemists, their specialty being looking after the requirements of iron and steel foundries and steel manufactories. They also carry on the assaying of ores. The officers of the company are as follows: President, J. D. Stoddard; vice-president, W. P. Putnam; secretary, Henry Blumhart; treasurer and manager, Hugh Lamont. This company was formed to look after the Canadian business of the Detroit Testing Laboratory, and although the company is a separate and distinct one, the management and shareholders are practically the same. Mr. Lamont, who will manage the Canadian business, has had many years' experience in handling analytical work in foundries, and has been connected for the last few years with the Detroit Testing Laboratory.

The G. & E. Improved Automatic Rack Cutter.

In a new design of Eberhardt's patent entirely automatic rack cutting machine, shown in the accompanying illustrations and built by Gould & Eberhardt, Newark, N. J., several new features have been embodied. An important change has been made in the design of the bed, which was formerly of the box leg type, supporting the main table bed. The new bed presents a continuous line of contact with the floor, and better resists the strains produced while the cutters are at work. The cutter slide is actuated on the draw-cut, or pull-down, principle, and in conjunction with this style of bed insures not only increased feeds, but greater accuracy in the work. That part of the bed which supports the upright cutter slide stanchion is also cast as an integral part of the main bed casting, still further increasing the rigidity.

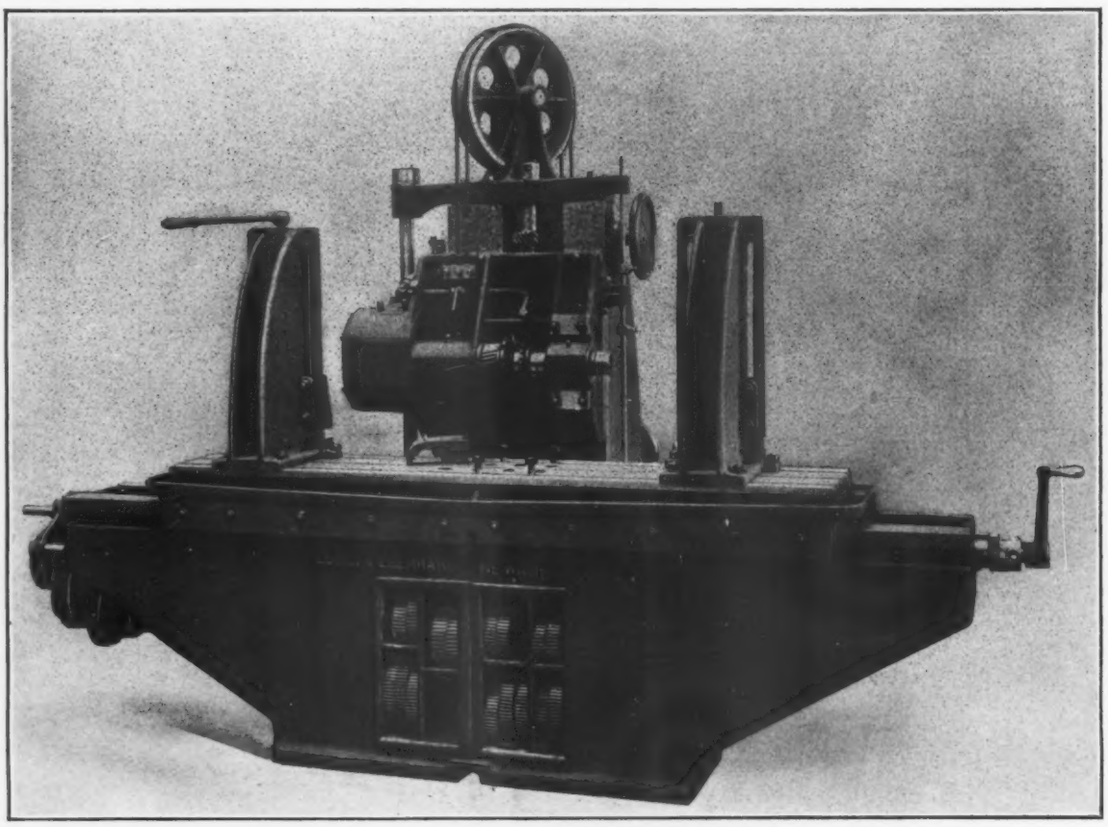


Fig. 1.—Front View of the Improved Automatic Rack Cutting Machine Built by Gould & Eberhardt, Newark, N. J.

These features are typical of the aims throughout the design of the machine to make it capable of using high speed steel cutters to full advantage and turning out very accurate racks.

The first machine of this type was built for a planer manufacturer for cutting planer table racks, and duplicate machines have been furnished to manufacturers of machine tools, printing presses, and for notching large track scale beams. The machine is built in 6, 8 and 10 ft. sizes. The one shown is the smallest—that is, will take work up to 6 ft. long at one setting, and longer lengths of rack can be cut by shifting the blank between operations. It will cut any width of face up to 10 in., or a series of narrow faced racks of equivalent combined width, and any pitch up to as coarse as 1½ diametrical pitch in cast iron or 2 in steel, using from 1 to 12 cutters, depending upon the pitch to be cut. It is possible to use a gang composed of one roughing and one finishing cutter at the maximum rated capacity of the machine. The gang cutters which are used have their cutting points set spirally to avoid chatter and rapid dulling of the cutting edges.

The cutter slide is counterbalanced and is so arranged that it cannot be fed downward unless the proper divi-

sions and all previous movements have been completed. The cutter spindle is located approximately in the center of the slide, and large bearing surfaces insure rigidity and freedom from chatter under the heaviest work. The cutter spindle is driven through double spiral gears, one gear effect neutralizes end thrust in the cutter spindle. The guard over the gears has been removed in Fig. 1 to show the position of this spiral gear drive, immediately adjacent to the cutter.

The feed to the cutter slide ranges in geometrical

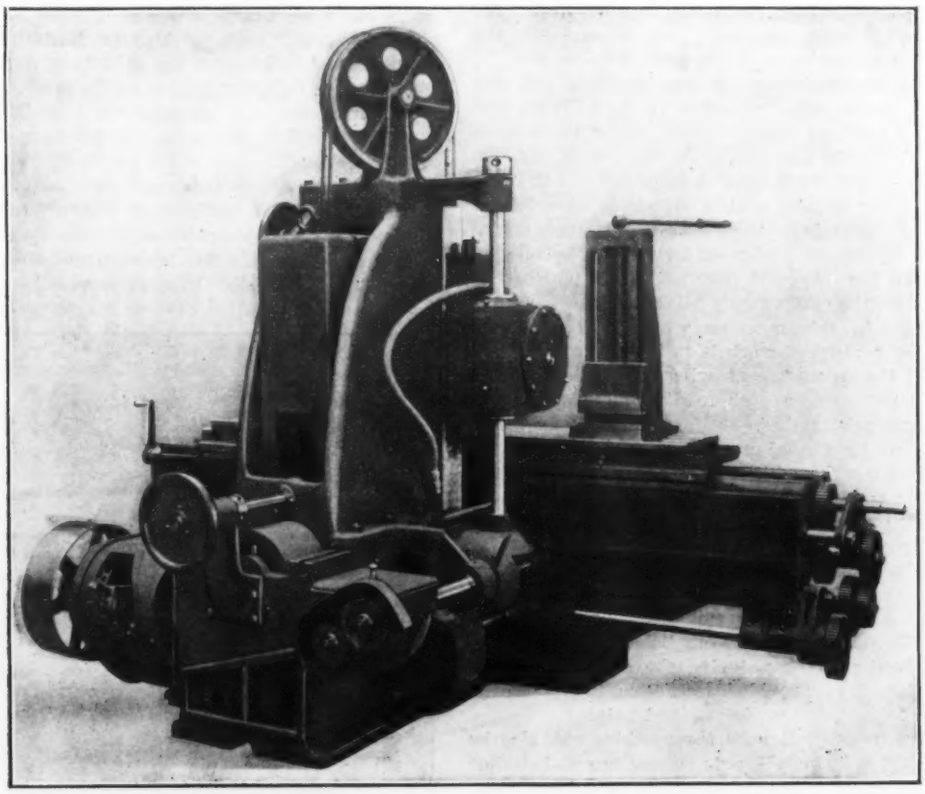


Fig. 2.—Rear View of the New Gould & Eberhardt Rack Cutter, Showing the Feeding Mechanism.

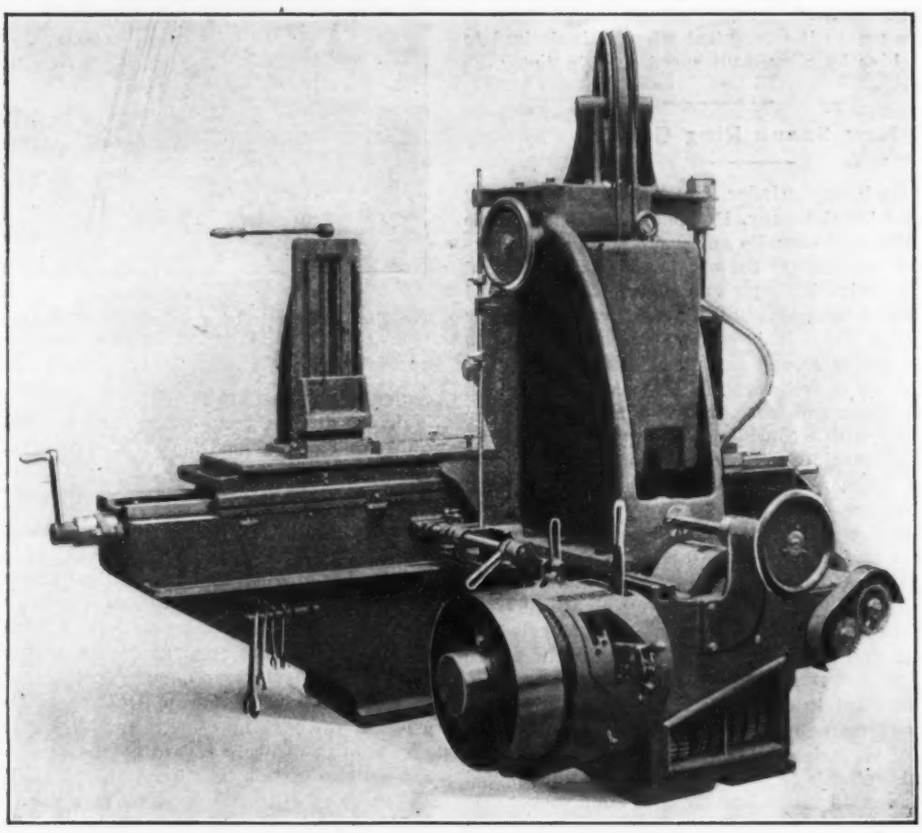


Fig. 3.—Another Rear View, Showing the Change Gear Box Transmitting the Drive.

pair being placed on the outboard end and the other pair close to the cutter, where the full driving effect can be obtained. One of these two pairs of spiral gears is cut right hand and the other left hand. This herringbone progression from ¾ to 14½ in. per minute, thus providing a range that will economically take care of all classes of work. The feed is taken from the single driving pulley of the machine, through the gear box shown at the rear

end in Fig. 2. Cutter speed changes are provided, from 12 to 76 rev. per min., in geometrical progression.

The chucks or vises for holding the rack blanks are rigidly held to the top of the table by bolts in T-slots. The vises are so designed that they can be fastened solidly, metal to metal, with the top of the table, without springing or warping the latter out of line. The table is provided with generous bearing surfaces and strongly gibbed to the ways of the main bed casting.

The blanks are held in a vertical position, and consequently the cutter slide travel is vertical. This permits chips and cuttings to drop down out of the way of the cutters. There is an opening in the bed of the machine through which the chips and lubricant are drained, the latter flowing into a pocket which is cast in the bottom of the bed, where a screen separates the chips from the oil. A second pocket is formed in the oil pan bed, into which the lubricant rises and from which it is again pumped to the cutters.

A departure in this machine which will be found useful where a variety of work is to be cut, as in a jobbing shop, is the arrangement whereby the same lead or dividing screw can be used to divide for either circular or diametral pitches, or for module or metric circular pitches, by changing two gears. An auxiliary end adjustment for the table screw is provided, which is often useful in resetting work to be recut or in taking a light cut from one side of a tooth. The table is geared to use the traveling movement in either direction, saving wear on the various parts, and obviating the necessity of returning the table every time a new blank is set. In this machine the dividing or advancement of the table for each tooth to be cut is accomplished by a positive dividing mechanism, thus reducing the chance of error. Adjustable stops are provided to automatically throw out the table feed at any predetermined points.

In addition to cutting racks the machine can also be used for milling or facing off spots on castings and similar work, generaly done on a vertical milling machine. The entire construction has been simplified, and only one belt is required to drive the machine, the various movements being transmitted through splined shafts, gearing, &c. This also makes it convenient when it is desired to drive the machine by a constant speed electric motor.

A New Saxon Ring Grinder.

The improved ring grinder, illustrated and built by the Saxon Machine Company, Holyoke, Mass., has ample weight and stiffness to handle any work within its capacity, which are essential to the obtaining of the required accuracy. The design is simple and effective, as evidenced by the fact that a large amount of work per hour can be turned out by a boy. It is contended that parts with open surfaces can be ground more nearly true on a rotating table than on a reciprocating table, and that much work done on larger and more expensive macihnes can be done on this one with a considerable saving of time. The grinding of piston rings can be accomplished with this machine at a fraction of the cost of filing and scraping. This is its most important function, for it has been demonstrated that properly fitted piston rings increase the power of a gas engine from 5 to 10 per cent.

The chuck is attached to a vertical spindle driven from the lower gear box, which gives eight different speeds for work of varying diameters. It is elevated by a hand wheel graduated to read in thousandths of an inch of vertical movement produced. Regularly a magnetic chuck is fitted to each machine, which affords the quickest way of fastening iron or steel work and avoids the liability of springing it. Either 110 or 220 volts, direct current, is suitable for the chuck and can be supplied through a connection made directly to a lamp socket. If direct current is not available, a small generator is furnished, which can be placed wherever convenient, and the wires brought to the grinder. The chuck takes no more current than an ordinary lamp. The magnetic chucks are made in three sizes, 8⅜, 10⅜ and 12⅜ in. diameter. A plain chuck is furnished for brass, copper, hard rubber or work of other nonmagnetic material, or if the magnetic chuck is not wanted. This chuck may be had with three or four jaws, as preferred.

The head which carries the wheel is adjustable to incline the spindle from the horizontal, so that work may be ground thicker or thinner at the center than at the circumference. This is necessary, for example, when grinding saws and cutters. The head may be advanced at three different speeds, giving the feeds best adapted to roughing and finishing. The spindle is provided with adjustable bushings, for taking up the wear, which are protected from dust to keep the bearings in perfect condition. The feed is automatic, but can be operated by hand when necessary. The wheel is 8 in. diameter, ¾ in. thick and has a 2-in. hole. All handles and dogs for adjusting the grinder to the work are on the side nearest to the operator. The machine occupies a floor space of 26 x 45 in., is 46 in. high to the center of the wheel spindle and weighs 1300 lb. The greatest distance from the center of the wheel to the chuck is 12 in. As the machine is driven directly from a line shaft no countershaft is required. The intended speed of the driving shaft is 450 rev. per min.

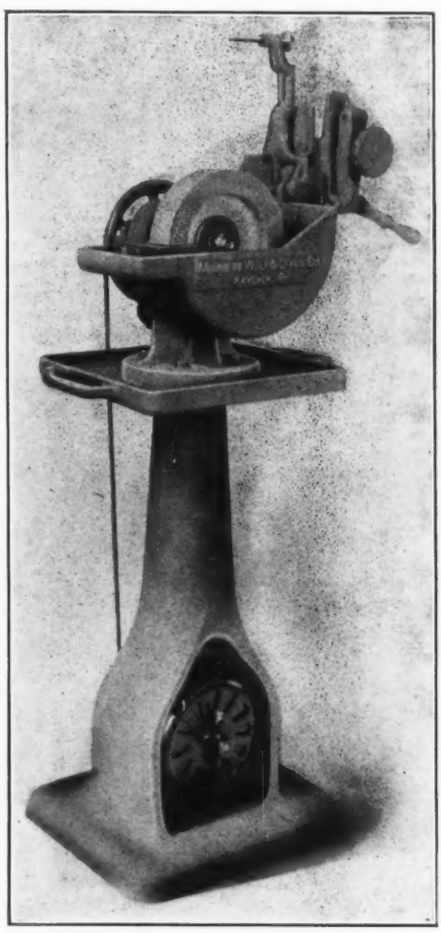
The New Automatic Ring Grinder Built by the Saxon Machine Company, Holyoke, Mass.

A Thermit Periodical.—The Goldschmidt Thermit Company, 90 West street, New York, has just begun the publication of a quarterly periodical known as *Reactions*, devoted to the science of aluminothermics. Its function will be to acquaint those concerned with the operation of foundries, manufacturing plants, railroads and others with the many improvements constantly being developed in connection with the applications of thermit, particularly in the making of repairs. It will invite inquiries and publish answers regarding the processes. The leading articles in this first issue are "Rail Welding," "The Influence of Nitrogen on Iron and Steel," "Recent Improvements in the Thermit Welding Process," "Important Repairs Made by the Process in 1907," "Applications of Thermit in Railroad Shops," "The Evolution of a Motor Case Repair," "Tests of a Thermit Weld," "Thermit for Military Purposes," and "Annealing Spots in Armor Plate." The publication is about 8 x 10¾ in. in size and contains 24 pages.

The Mummert, Wolf & Dixon Scraper Sharpener.

The old method of sharpening a scraper, by rubbing it over an ordinary oilstone, requires not only considerable time, but experience, so that the scraper when sharpened will take hold of the surface being scraped. To accomplish this work quicker and more accurately the Mummert, Wolf & Dixon Company, Hanover, Pa., has designed a motor driven revolving oilstone scraper sharpener, shown in the accompanying engravings. The machine will grind the face perfectly straight or slightly convex, if desired, or by holding the scraper on the periphery of the stone and nearly tangent to it the sides may be concaved, giving two acute angle cutting edges, which cut very freely. By the hand method of sharpening this was not possible, as the angles had a tendency to become obtuse, and if not held at the proper angle the tool would not take hold on the surface to be scraped.

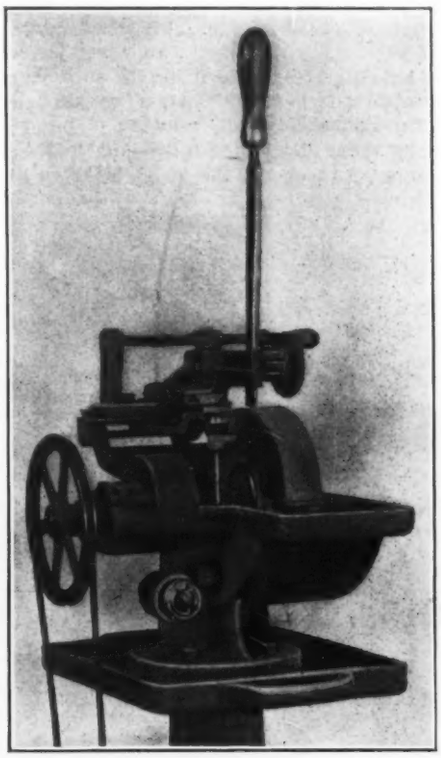
The tool to be ground is held in an attachment comprising a vise which is attached to compound slides, and



The Self-Contained Motor Driven Scraper Sharpener Built by the Mummert, Wolf & Dixon Company, Hanover, Pa.

by the use of the hand lever the vise and scraper may be moved parallel with the wheel and laterally across its face. By these two motions the wear is evenly distributed over the whole face of the stone. To enable the scraper to be quickly and accurately set in the vise there is a small platform provided, which is always in line with the face of the wheel and parallel with the lines of motion of the two slides. Therefore, to set the scraper it is only necessary that the vise be pushed back over the platform, the scraper placed in the vise and clamped by means of a small hand wheel, when the vise is again moved laterally over the wheel and grinding proceeds. The feed is regulated by an adjusting screw on an arm at the front of the holding attachment. This attachment is hinged at the back, so that it may be swung out of the way for doing other kinds of grinding, such as the sharpening of cutting tools.

The oilstone wheel in this machine runs in a bath of kerosene oil, which prevents heating of the tool, and keeps the surface of the wheel clean and sharp. The wheel is driven through a set of spur gears, having a ratio of two to one. The drive as shown in the illustration is by a motor, placed in the hollow base of the pedestal. This is of ⅛-hp. and is furnished for use with either direct or alternating current. It is usually supplied from an electric light circuit through an ordinary lamp socket at the back of the machine. A small snap



Detail of the Scraper Sharpener Head as Set for Honing the End of a Scraper.

switch for starting and stopping is conveniently located at the front of the machine, within easy reach of the operator.

The machine can also be furnished with pulley and countershaft for belt drive, if so desired. While the machine is heavy enough to be firm it is not too heavy to be easily transferred from place to place, and is provided as shown with handles on either side of the bed plate, so that two persons can move it readily.

The Mount Union Silica Brick Company.

The general sales office of the Mount Union Silica Brick Company, which has been maintained in the Park Building, Pittsburgh, has been transferred to the works at Mount Union, Pa. W. H. Hill, who has been the general sales agent, is no longer connected with that company. This change in the personnel of the sales organization and in the location of the sales offices should not be construed to mean a reduction of the company's organization or efforts. It was made as a part of a policy of concentration and centralization, which policy, the company is confident, will also benefit its trade, as it places the entire responsibility of manufacture and distribution under the one central management.

The plant has been in successful operation for six years and during that period its product has grown in the esteem of all users. The sales having steadily increased, the plant has been enlarged and maintained on a thoroughly modern scale to permit an output sufficient to insure prompt shipments. The company carries at all times a large stock of regular sizes, together with the most generally used special shapes. When large orders of special shapes are required the company's facilities are such that it can make and ship the goods in the minimum time. All communications from this time should be sent to the Mount Union Silica Brick Company at its general office and works, Mount Union, Pa.

Hart's Buckeye Die Stock.

The distinctive features of the Buckeye pipe threading die stock recently brought out by the Hart Mfg. Company, Cleveland, Ohio, are the form of the dies, the provisions for adjusting them, and automatically releasing them, and the die leading device and cutting-off attachment.

The dies are of the chaser form, and are made to cut easily by being formed with a short cutting edge. They automatically recede radially as they are advanced on the pipe, which makes it possible with such short edges to produce threads having the taper necessary for pipe joints. The remarkably small amount of power needed for working these dies is due principally to the reduced friction between them and the metal being cut, as compared with that accompanying the use of dies with cutting edges of the usual length equal to the length of the taper threads desired. The cutting edges are also so made that the dies will do their work without the aid of a leader screw. Each of the dies is a plain, flat piece easily removed from the tool, and as readily sharpened as an ordinary chisel by grinding its edges. The dies themselves and the stock allow a wide range of diameters to be covered by one set. For example, a single set is used for cutting 1, 1¼, 1½, and 2 in. pipes, which avoids frequent changes and the care of additional parts. The adjustability afforded allows for varying the size cut either larger or smaller than standard.

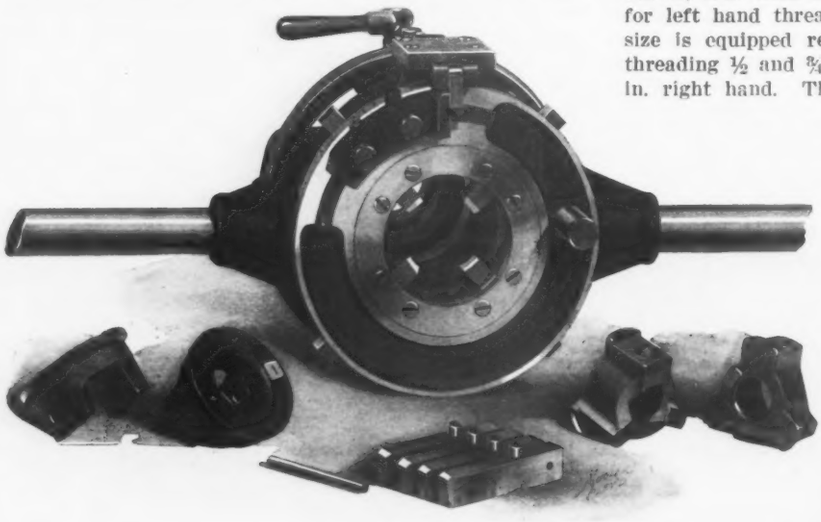


Fig. 1.—The No. 23½ Buckeye Die Stock Made by the Hart Mfg. Company, Cleveland, Ohio

As soon as a sufficient length of thread has been cut the dies release themselves from the work. A slight turn of the controlling cam plate by hand then retracts the dies enough to clear the thread while the tool is being removed without turning it backwards over the thread. To cut a duplicate thread the dies can be instantly reset by turning the cam plate until two parts are brought into contact, one of which acts as a stop. No clamping is necessary in this operation.

Instead of a leader screw ordinarily used with the narrow expanding style of dies, a leader ring has been adopted which starts the dies without hand pressure to force them on the pipe. The thread cutting that the tool is capable of doing is thus not limited simply to threads of the same pitch as with a leader screw, nor to one direction of lead. To adapt a tool to the cutting of left handed threads the leader ring is released from engagement by moving a screw. The dies can then be started by hand pressure. After a thread has been finished, no reversing of the dies is necessary nor screwing apart of pieces, as there is with a leader screw. Neither is there the wear to contend with that occurs to a leader screw and is ordinarily as much to be watched as that of the cutting edges of the dies.

A cutting-off attachment can be clamped on the tool when desired. It does its work smoothly and with moderate speed, cutting the ends square and clean without leaving a burr on the inside or outside. The cutter is in full view of the operator, and can be quite readily detached for grinding.

The supplying of lubricant for the dies during their cutting is amply provided for by pockets for injecting the oil, besides which there are pockets in which it is caught as it drips from the work, and is repeatedly poured on the dies and the work. For threading nipples or short pieces of pipe nipple holders may be inserted in the tool.

At present the die stocks are made in two sizes, No. 23 having a range of from 1 to 2 in. pipe, and No. 23½ from ½ to 2 in. pipe. The first is equipped with one set of dies that threads 1, 1¼, 1½, and 2 in. right hand, and weighs 29 lb. It is furnished either with or without the cut-off, and with extra dies for cutting extra sizes or for left hand threads when so ordered. The No. 23½ size is equipped regularly with two sets of dies, one threading ½ and ¾ in., and the other 1, 1¼, 1½ and 2 in. right hand. This stock weighs 31 lb., and is also provided when so ordered with cutting off attachment and extra dies for either right or left hand. Special dies can be supplied for bolts and plumbers' drawn brass pipe, and when required, dies for threading 1¼ in. English pipe.

Fig. 2.—One of the Removable Dies.

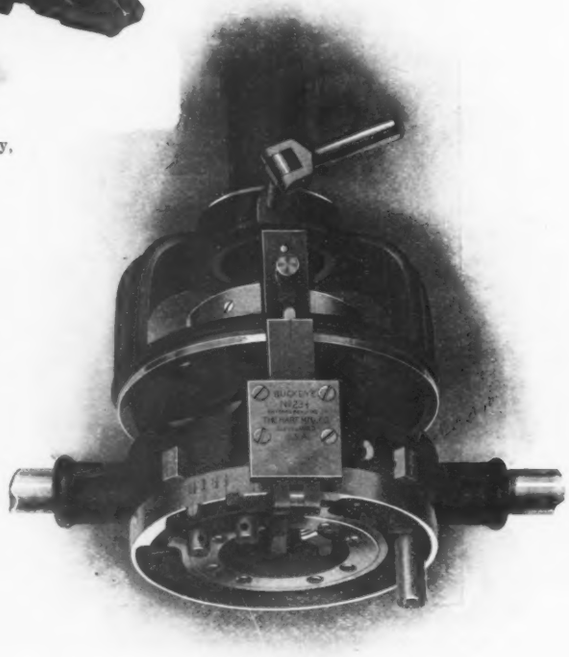


Fig. 3.—A Top View of the Stock Ready to Thread.

A general view of the die stock which also shows bushings and extra chasers is given in Fig. 1, and a detail of one of the chasers in Fig. 2. A view from above, when the stock is ready to thread, is given in Fig. 3, and Fig. 4 shows the leading device and Fig. 5 the stock equipped with the cutting-off attachment. The construction is well shown in the line drawing, Fig. 6.

In the working of the tool the outward pressure of the chaser dies operates to turn the cam plate *g*, Fig. 6, in a clockwise direction, and by properly controlling this movement by the contact of the helicoidal surfaces of

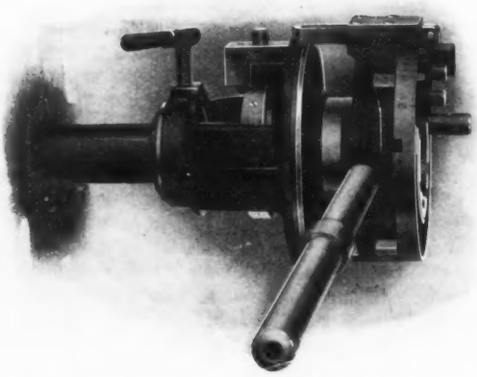


Fig. 4.—A Side View of the Stock, Showing the Leading Device.

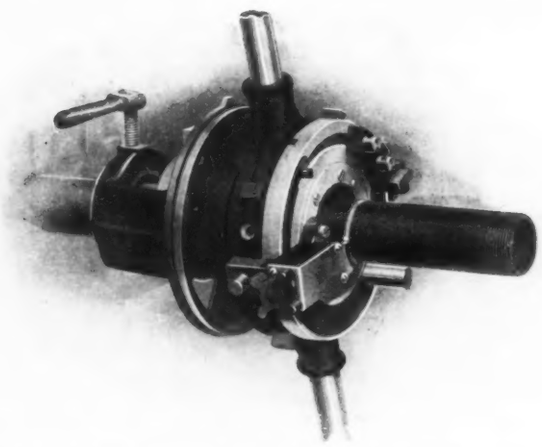


Fig. 5.—A Stock Equipped with the Cutting-off Attachment.

the stop *c* and the dog *l* the dies are allowed to expand as they screw on the pipe at a rate which produces a thread of correct taper. When the body *a* is located properly in the frame *b* to begin the threading, the pin at the right in the plunger block *j* is in contact with the leader ring *k* at the most depressed point on its right or front edge. It is possible then to only revolve the body in one direction, the proper one for the thread that is to be cut. The function of the leader ring, a detail of which is shown at the left in Fig. 6, is simply to aid the starting of the thread; it performs all of its work during the first revolution of the body or die head. When the body has almost completed one revolution the plunger at the left of or behind the ring mounts upon an incline on the ring's rear edge and disengages from that edge.

At this instant the hardened pin is at the highest point of the front edge of the leader ring. On further revolving the body contact between the pin and the leader ring discontinues and the plunger rides around on the cylindrical surface of the leader ring until it drops down in front of the ring. From this position it can be slipped back over the ring, when it snaps down behind the ring, the action being similar to that of a spring latch, due to the bevel surfaces on the front edge of the ring and the rear of the plunger and the helical spring coiled around the plunger.

In using the die stock the body *a*, Fig. 6, is first properly positioned in the frame *b* by turning it so that the rider bar *c* is in line with a boss at the top of the frame, and then it is pulled forward out of the frame as far as possible. The stop *e* is then clamped so that the mark on the boss *f* is in line with the mark opposite the figure denoting the size to be threaded, after which the cam plate *g* is turned until the stop touches the dog *c* which should be thrown down in its way. A bushing, *h*, of proper diameter should be placed in the rear of the frame. The tool is next put on the pipe with the rider bar above the center and pushed back so that the pipe enters the dies as far as possible, when the set screw *i* is tightened. While threading is being done the dies are lubricated by injecting lard oil into holes through the body. When the dog slips past the end of the stop and the dies have released themselves from cutting they are opened by turning the cam plate slightly. Finally the body is brought to starting position again before the set screw *i* is released and the tool removed.

Where a few left hand threads are to be cut it is simply necessary to remove the plunger block *j* and proceed as in cutting right hand threads, except that a little pressure is required on the front of the body to make the dies grip. A leader ring, *k*, for left hand threads can be supplied if desired. To cut straight threads, that is without any taper on the pipe, the frame *b* is allowed to revolve with the body *a* and the clamp screw *i* is not set. To remove the dies the screws on the stop *e* are first loosened, and the dog *c* swung out of the way of the stop, then turning the cam plate *g* so as to open the dies as far as possible allows them to be withdrawn. The handles are made with two sections so that when a great leverage is not required, as on small pipes of ½ or ¾ in., only the inner end pieces need be used.

The cutting-off attachment is used as indicated in Fig. 5. During its use blank dies are inserted in place of the cutting dies, and the stop *e* of Fig. 6 is set as in threading. The plunger block *j* is removed, and with the dog *c* turned to point toward the center of the tool the body *a* is positioned in the frame *b* so that the outer end of the stop just catches the dog. The tool is then slipped on the pipe, and when the cutter is screwed out and set where the cut is to be made the frame is pushed backward until the dog wedges tightly on the surface of the stop, then the set screw *i* is tightened. The cut is made by feeding lightly with the hand wheel shown, care being taken to turn the stock around the same as when cutting right hand threads. The cutter is sharpened by removing the cover plate of the attachment and grinding the surface on the end of the cutter, keeping the angle with the top edge as it was originally.

The Ellwood Ivins Tube Works, maker of seamless steel tubing, whose mills and general offices are at Oak Lane Station, Philadelphia, has recently opened an office at 315 Chamber of Commerce Building, Chicago, to look after its Western business. The company still continues its established New York office at 487 Broadway and its English branch at 13 South Hampton street, London.

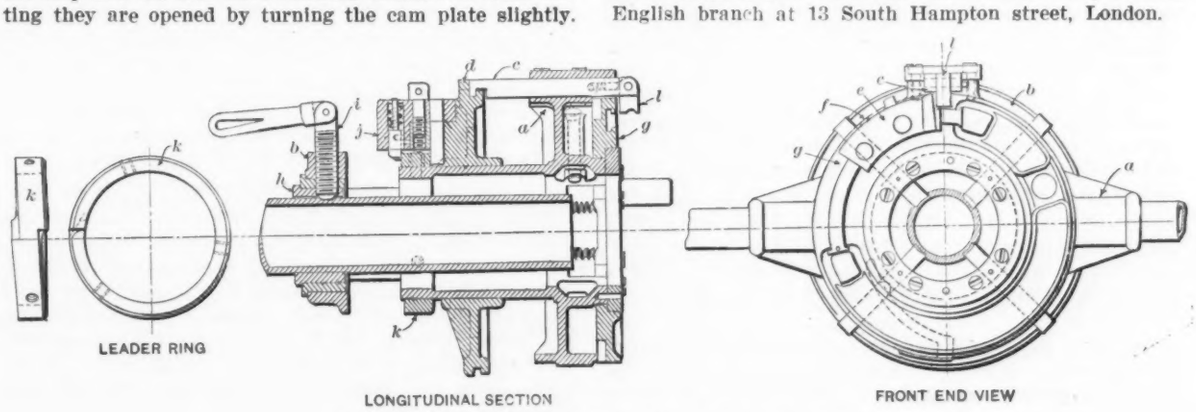


Fig. 6.—Constructional Details of the Buckeye Die Stock.

The Analysis of Blast Furnace Tuyeres and Similar Castings.

BY M. ANDERSON, PITTSBURGH.

The methods here given are supposed to be new, as they represent considerable experimenting by the writer. For the analysis of blast furnace tuyere metal, dissolve the drillings, one-half grain, in just enough 1 to 1 nitric acid to effect solution, using a 100 c. cm. capacity glass beaker. Evaporate off the dark fumes and add 5 c. cm. concentrated sulphuric acid, letting it run down the sides of the beaker into the nitric acid solution to avoid violent action. Now evaporate to white fumes of sulphuric anhydride. Remove from heat, allow to cool and fill the beaker half full of cold water, stirring well to get the copper sulphate dissolved. Possible lead sulphate will appear as a fine white precipitate. Possible tin will be in solution, as sulphuric acid dissolves metastannic acid. When the copper sulphate is all broken up and in solution, filter off the lead sulphate on a dense paper, previously dried and weighed, washing with 2 per cent. sulphuric acid and receiving the filtrate in a 600 c. cm. capacity beaker. Dry at 110 degrees C. and reweigh after all moisture is gone. The increase multiplied by 2 then by 68.3 gives the per cent. of lead.

To the filtrate introduce for 15 min. briskly hydrogen sulphide gas generated in a filtering flask, using blast furnace slag dissolved in hydrochloric acid. Allow the precipitates of copper and tin (sulphides) to settle and filter on a soft paper (15 cm. diameter), washing several times with water and receiving the filtrate in an 800 c. cm. capacity beaker, setting the solution on heat and boiling off the hydrogen sulphide gas. The precipitates of tin and copper are dissolved in nitric and hydrochloric acid in the following manner:

A 250 c. cm. capacity beaker is placed under the funnel and a hole is punched in the paper and precipitates washed through with hot water, using as little as possible. Then pick up the paper with the fingers, open out and wash the rest into the beaker. The stain left is immaterial. Now introduce concentrated nitric acid to beaker little by little until all copper is dissolved. Place on heat and boil hard; then add enough hydrochloric acid to dissolve the tin precipitate, when the solution becomes clear. Add about 10 c. cm. concentrated nitric acid and evaporate off hydrochloric acid, at which point, with an excess of nitric acid, metastannic acid separates out. Evaporate to just short of dryness, remove, add hot water to half fill the beaker, allow the residue to settle and filter on a dense paper, washing with hot water. The filter and contents are placed in a porcelain crucible and dried, charred, burned and ignited in a strong heat to stannic oxide. Its weight multiplied by 2 and then by 78.8 gives the per cent. of tin. The filtrate is the copper in solution. As copper is determined by difference it is not needed.

The solution boiling contains possible iron and zinc. Use ammonia to excess and throw down ferric hydroxide, boil, allow to settle, filter on soft paper, catching the filtrate in a 1000 c. cm. capacity beaker. The precipitate and paper are burned in a porcelain crucible over a bunsen flame to ferric oxide, which multiplied by 2 and then by 70 gives the percentage of iron. The filtrate from the precipitate of iron is made acid with a few drops of sulphuric. Then add 30 c. cm. of a cold saturated solution of sodium and ammonium phosphate. Heat to boiling and precipitate zinc ammonium phosphate by adding ammonia water slowly to slight excess while the solution is stirred constantly. Continue boiling and stirring until the solution is as near as possible to the exact point of neutrality. Let settle, wash with hot water until free from phosphoric acid; use a dense paper previously dried and weighed and dry the precipitate at 110 degrees C. The increase in weight multiplied by 2 then by 36.49 gives the percentage of zinc.

Notes.

Good judgment is required when reporting the amount of iron, whether impurity or contamination, on a discarded casting. Considerable iron is present, put there by the furnace. If the analyst drills the sample he should either clean the surface with acid or drill deep, brushing away the first drillings.

Tin in the presence of iron solution is sometimes soluble or partly so in nitric acid; also very difficult or impossible to filter, metastannic acid going through the paper. So dissolving the metastannic acid in sulphuric, precipitating as stannic sulphide with cupric sulphide, dissolving both in nitric and hydrochloric, evaporating low with the excess of nitric acid to separate out the metastannic, and then determining as stannic oxide, are the features of the method especially recommended for tuyere analysis and similar bronze and copper castings used at a blast furnace.

It is hard to dissolve cupric sulphide by nitric in the cold, so boiling is necessary, when finally all will go in solution. Only add the hydrochloric after the cupric sulphide has been dissolved.

Report the analysis to add up between 99.80 to 99.90. There is always a little oxide in the metal; also phosphorus, probably. If this determination is asked for dissolve 0.815 gram in 30 c. cm. 1 to 1 nitric, using a 500 c. cm. capacity Erlenmeyer flask. Boil off dark fumes; add a little saturated solution potassium permanganate sufficient to oxidize the phosphorus. Then add hydrochloric acid drop by drop to clear the solution, and dissolve the metastannic acid. Finish as if pig iron, weighing the yellow precipitate direct after drying.

A New Steel Deoxidizer.

The influence of manganese, silicon and aluminum in the prevention of blowholes and in the deoxidizing of steel is well known and generally admitted. One of the chief causes of the formation of blowholes is due to ferrous oxide present in the molten metal. It has been found by careful experiments that the deoxidizing action of manganese, silicon and aluminum is more thorough and gives more uniform and satisfactory results when these metals are added to the molten steel in the form of a triple alloy of special composition. The same results cannot be obtained by adding these metals singly or in the form of ferroalloys. Many works attempt the complete deoxidization of steel by adding proportions of ferromanganese, ferrosilicon, or a manganese silicon alloy and aluminum. The composition of these alloys varies considerably, and the results obtained are by no means satisfactory.

For many years a silicon, aluminum and manganese alloy has been manufactured by an English firm, Geo. G. Blackwell, Sons & Co., Ltd., of Liverpool, and this alloy is being extensively used. This firm has recently patented and is now introducing for high grade steels a much more powerful combination of these three metals, which is of the following approximate analysis:

	Per cent.
Manganese	58
Silicon	25
Aluminum	15
Iron	2
Carbon	0.20 to 0.30

The firm states that this combination alloy can be used in all classes of steel, and will be particularly advantageous for the manufacture of high grade steel castings. In practice it is found that the addition of 350 to 375 g. of the alloy is sufficient to deoxidize completely 100 kg. of open hearth steel. To do the same work with 80 per cent. ferromanganese about 1.5 kg. of that alloy would have to be added, and one third of this, say, about 0.5 kg., would remain undecomposed in the steel in the form of double carbides of iron and manganese.

The Standard Building Construction Company, 828 Fulton Building, Pittsburgh, has recently completed the erection of a plant of concrete construction at Neville Island, near Pittsburgh, and is now operating it. This plant is designed on the most approved lines and contains the latest motor driven machinery for the manufacture of standardized concrete building material, including concrete joists, sills, concrete protection and other products required in building construction.

A Transfer for Rolling Mills.

A rolling mill transfer system, one form of which is to be installed in the rail mill of the Indiana Steel Company at Gary, Ind., has been patented by K. C. Gardner of the United Engineering & Foundry Company, Pittsburgh. The illustrations show the application of the invention to the side transfer of metal from one roller table in line with a rolling mill pass to another roller table at a higher level, arranged to feed the metal to another pass. Fig. 1 is a cross section and Fig. 2 a partial plan view. The plain faced rollers of the table on the lower level are shown at *a*, and *b* represents the parallel rollers of the table, these being provided with grooves, as shown. The rollers are driven by the shafts brackets secured to a rock shaft, *n*, capable of moving endwise in its bearings. The rollers *b* are shown with grooves for feeding three passes, and the bottom of the guideway is made in three parts, any one of which may be dropped so that the dog may fall and the piece be thus disengaged at this point. These bottom sections are kept closed by lugs which rest on projections. In releasing any bottom section the corresponding shaft *n* is rocked to raise the lug off its projection. The shaft is then moved endwise a short distance, so that the lug clears the end of the projection and the door falls by gravity, the metal being thus deposited at the desired point. The travel of the chains may be stopped by the operator until the next section arrives on the roller table *a*, when the chains are started in motion and the next dog engages the piece. If desired the bottom sections of the chain

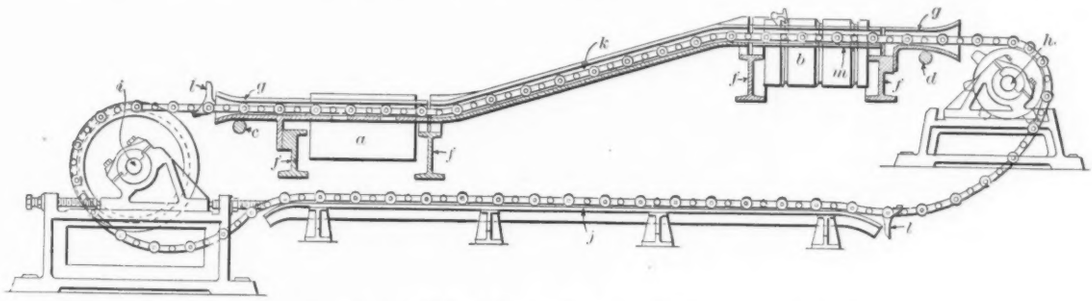


Fig. 1.—Cross Section of the Gardner Transfer System for Rolling Mills.

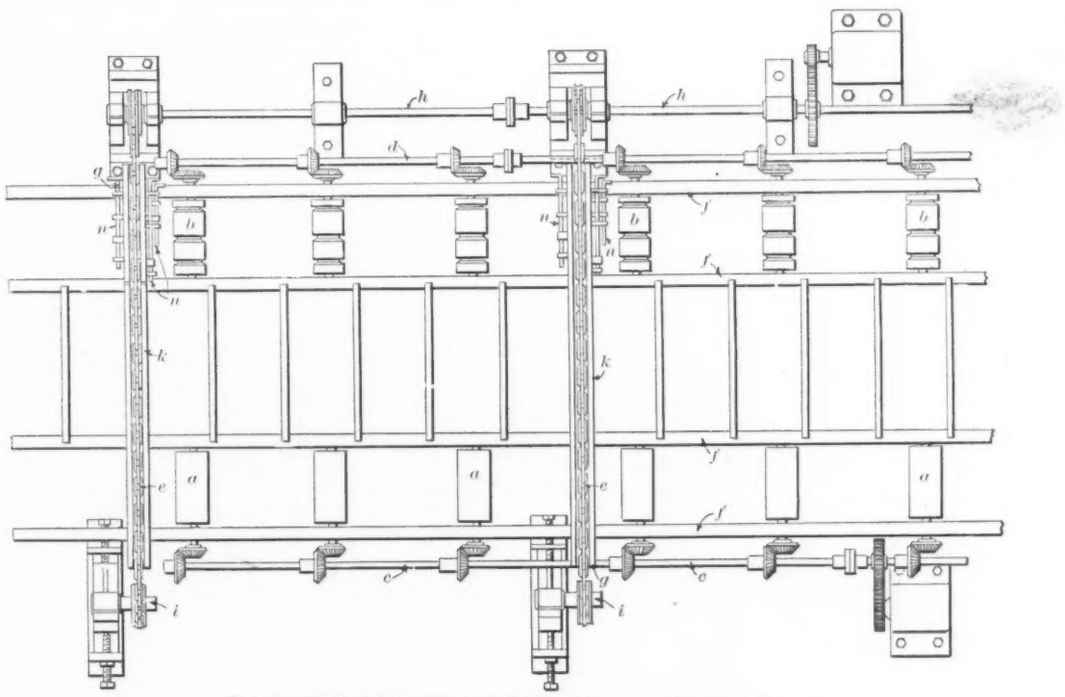


Fig. 2.—Partial Plan View of the Gardner Transfer System.

c and *d*, having bevel gear connections with the shafts of the table rollers. The sprocket chain *e* has for its upper guideway two channel shaped sections with wide lower flanges which project toward each other. The channels are supported on the side I-beam members *f* of the roller tables and terminate in bell shaped castings at each end. The sprocket wheels are mounted on shafts *h* and *i*, adjacent to the delivery table. In its lower path the chain is supported on a guide, *j*, while the rollers carrying it travel between the flanges of the beams *k*.

In the operation of the transfer the piece is engaged by the dog *l*, which is in the form of a bell crank pivoted to the chain pin between two of the links and connected by a cross bar below them. This prevents the dog from swinging forward beyond its upright position, and this position is maintained except where the inner flanges of the channel track of the chain are cut away for depositing the piece. The bottom of the track through its delivery portion between the rollers *b* is cut away, being made in separate sections or doors, *m*. These are carried on channel may be grouped between the two roller tables and the dogs used to feed to one side of the group and take away from the other side. Other modifications may be made, moreover, by providing the removable floor sections or dog supports where it is desired to stop the metal, or the dog supports may be cut away if no adjustment is desired. It is possible also to employ the apparatus for hot bed or other side transfer service.

Metal gaskets made so that they can be cut in the shop to fit any kind of a union have recently been put on the market by the U. S. Indestructible Gasket Company, 16 South William street, New York City. These gaskets, which are made of a lead composition, are made in rolls up to 84 in. in width and 1-32, 1-16 and 3-32 in. in thickness. Gaskets can be cut to fit irregularly shaped unions such as are used for ammonia and hydraulic work. They will withstand a pressure of 6000 lb. to the square inch and a temperature of 800 degrees F.

The Wilmarth & Morman No. 2 Surface Grinder.

A new type of grinder which may be furnished simply for surface grinding, as in Fig. 1, or with cutter, reamer, and drill grinding attachments, as in Figs. 2 and 3, is manufactured by the Wilmarth & Morman Company, Grand Rapids, Mich. The surface grinding table may be had with hand feed only, or with both

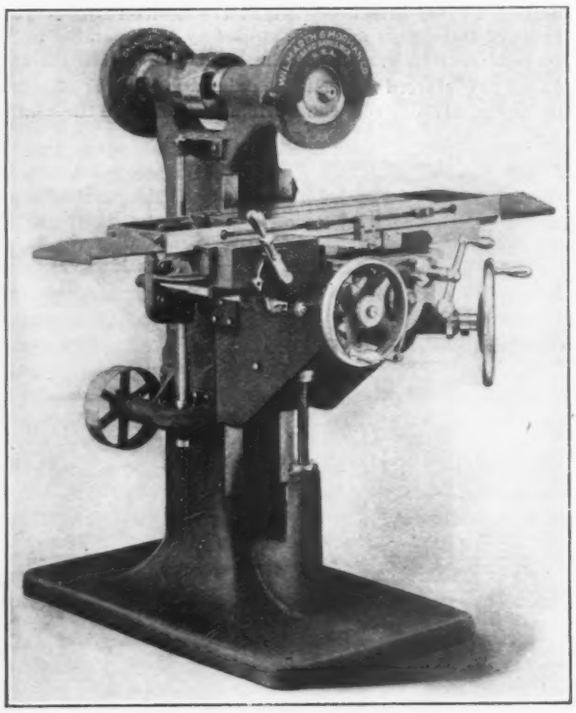


Fig. 1.—The New Wilmarth & Morman Grinder Equipped for Plain Grinding.

hand and automatic feed, for the longitudinal movement only or for both the longitudinal and the traverse movements. Where the grinder is furnished as a plain hand feed machine, longitudinal movement is through a plain rack and pinion type of feed which is operated by the hand wheel at the left of the front of the knee. The transverse movement is effected by a screw indexed by thousandths, with a ball crank handle at the right of the front of the knee, and the vertical adjustment, indexed by one-half thousandths, is operated by the hand wheel at the right of the knee in connection with bevel gears driving the elevating screw, which works in a bronze nut. The weight of the knee is largely carried by ball bearings on the elevating screw and is thus removed from the column bearings.

The transverse automatic feed is applied or released by a friction device operated by the small knurled hand wheel in the center of the large longitudinal feed wheel. This feed may be arranged to operate in either direction, at the will of the operator, who also has full control over the amount of feed. When automatic feeds are used the drive is by bevel gears with a reversing clutch on the vertical shaft at the left side of the machine. The clutch is counterbalanced to make it work more freely. The reversing mechanism is mounted on the front left end of the saddle, and its lever may be placed to hold the clutch in neutral position when the hand feed is being used. Fig. 4 shows the tripping mechanism actuating this clutch, the inclosing case being removed.

The cutter and reaming grinding attachment, which is secured on the table by two bolts, gives a capacity for large face mills, small angle cutters, reamers of all kinds, and milling cutters, including face and side mills up to 13 in. in diameter, which results in a universal type of cutter and reamer grinder which can be manipulated conveniently and quickly.

The New Yankee drill grinding attachment can also be supplied for grinding drills of any range of sizes, and is attached to an extension at the rear of the spindle where it does not interfere with the use of the surface grinder, thus one operator may do surface grinding while another is sharpening a drill.

The spindle is of crucible steel, ground and lapped, and is supported close to the wheel to avoid spring or overhanging strain and eliminate vibration. The two-step spindle cone pulley is turned inside and outside to secure perfect balance. Fig. 5 gives a sectional view of the spindle construction. The bearings are of phosphor-bronze, 8 and 5 in. long, respectively, and 2 in. tapered to 1½ in. in diameter. They have convenient means for adjusting either box independently. The housings for the boxes are bored in the main column casting which insures perfect and permanent alignment of the spindle bearings. This is important, as all working surfaces are trued to proper relation with the spindle. Making the spindle bearings integral with the frame provides a rigid spindle design, obviously preferable to split boxes, babbitted bearings and constructions in which the spindle bearings are carried by attached parts.

The saddle is 36 in. long, thus giving a liberal bearing for the table. The front bearing is a sharp V-way, while the rear bearing is broad and flat. A gib at the rear of

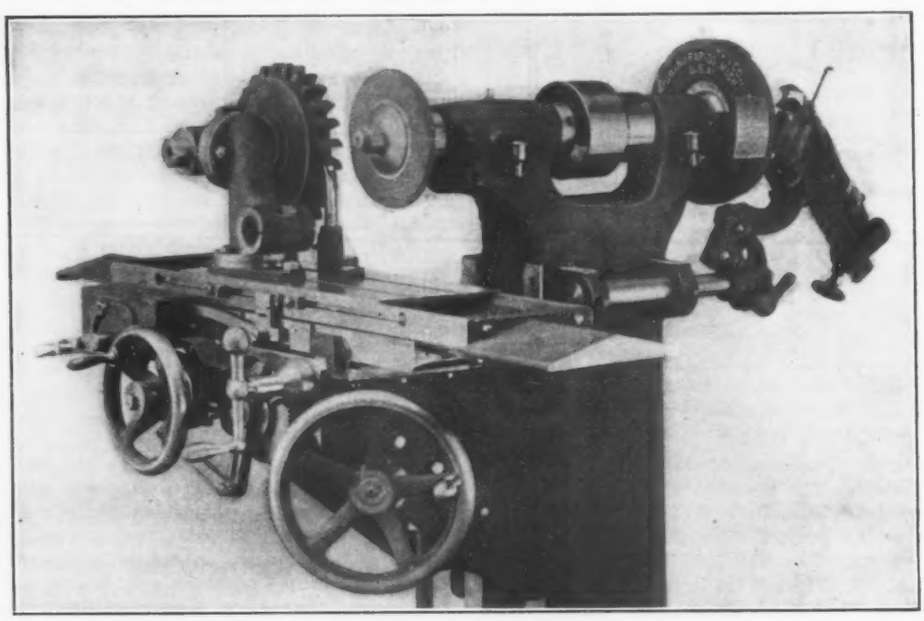


Fig. 2.—The Machine Equipped for Grinding Milling Cutters, Showing Also the Drill Grinding Attachment.

the table effectivelly prevents tipping even when an excessive load is placed on the overhanging end of the table at its extreme limit of travel.

The table is 8 x 50 in. in size, and has a working surface of 8 x 20 in., the 20 in. length of travel being carried, as mentioned, by a 36-in. length of saddle. The machine is intended to use a 10-in. wheel for ordinary

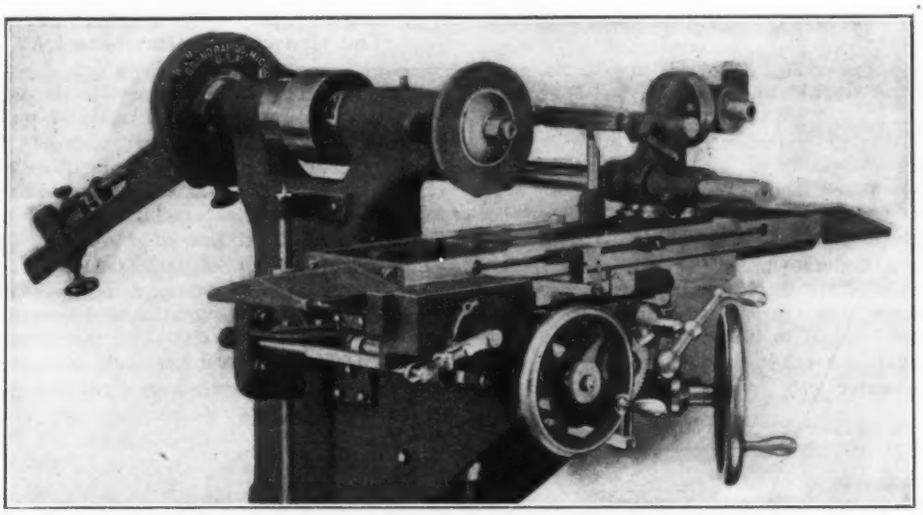


Fig. 3.—The Machine Equipped for Reamer Grinding, Also Showing Drill Grinding Attachment.

surfacing work, and a 7-in. wheel for cutting and reamer grinding, or surface work where circumstances make it preferable. The two steps of the spindle driving cone are proportioned for proper speeds for either the 7-in. or the 10-in. wheels. With the small wheel work up to 13 in. high may be accommodated, and with the large wheel work up to 11½ in. high.

Lubrication has been given careful attention. The oil chambers are large and supply the bearings with oil through felt wicks by capillary attraction. Surplus oil that may run to the front of the taper bearings is re-

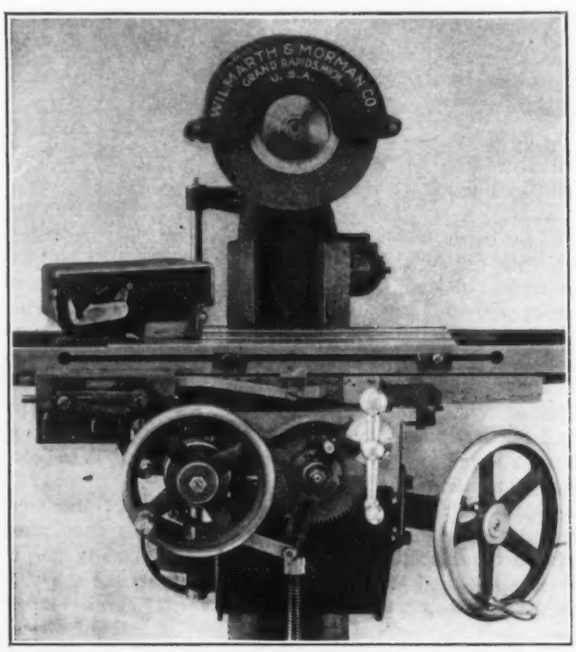


Fig. 4.—Front View, Showing the Feed Reversing Mechanism with Cover Removed.

turned to the oil chambers by small channels. All gears are shrouded, and the gears, ways and bearings are protected from dust and dirt.

The Proposed Copper and Brass Institute.—The movement in England to form a copper and brass institute appears to be proceeding with promise of success. A large meeting of copper and brass manufacturers was held in Manchester, March 10, at which the proposition was thoroughly discussed. Quite a number of letters were received from others unable to attend, all of which were in support of the project. It was decided that, while the sentiment of the meeting was favorable to the formation of an institute, it was desirable that before entering upon its definite constitution manufacturers, large users, consulting engineers and scientists should be further ap-

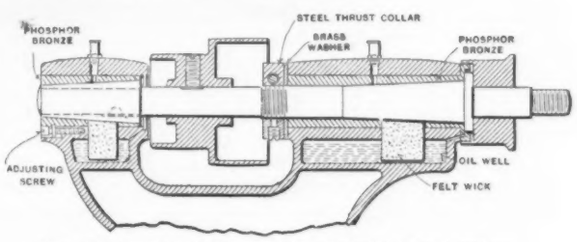


Fig. 5.—Sectional View of the Spindle Construction.

proached. A later meeting was, therefore, called in London on June 10 for a final decision as to the feasibility of forming such an institute. Dr. Carpenter, professor of metallurgy at the University of Manchester, has consented to become the secretary *pro tem* of the proposed institute, and will be pleased to receive letters on the subject. The society, if formed, is to be cosmopolitan in membership and not confined to Great Britain. It is stated that the project has already secured the support of many leading Continental metallurgists and scientists.

The Pennsylvania Railroad Claim Department.

To promote greater promptness in settlements, the Pennsylvania Railroad Company has increased the force employed in its claim department. Instructions have been sent to all freight agents, directing them to give prompt attention to claims, division freight agents being empowered to settle small claims, which are obviously proper, with cash instead of waiting to have them audited and paid through the general office. Considerable extra work devolves upon the claim department because, under the Hepburn law, it is more than ever necessary to make certain that a claim is just and true, and that there is no possible element of an improper refund involved.

As the principal delays occurring in the past have been in cases where it was necessary to make investigations through other railroads, a new system has been devised whereby correspondence shall hereafter be with agents of foreign roads instead of through the circuitious method of first addressing head officers. Delays have also occurred through the loss of papers, which were being sent from point to point, but hereafter all papers will be retained at the main office, and only a brief of the claim sent out. This will be highly pleasing to shippers and often save friction and bitterness. As an additional measure to secure promptness, a special set of men has been detailed to trace and keep claims moving, and to see that when delays occur, the cause is ascertained, and if possible removed.

The Norka and Economy Drills and Chucks.

The Whitman & Barnes Mfg. Company, Chicago, Ill., maker of the Diamond carbon and high speed twist drills, has brought out two new types of drills and chucks, here illustrated. The Norka high speed twist drill, Fig. 2, and chuck, Fig. 1. are the latest, having been but recently perfected. This drill, instead of being mill grooved in the usual way, is formed flat and twisted while hot. It is contended that by this process the grain of the steel is undisturbed, and that the steel is strengthened rather than impaired by this treatment. While it is not claimed that the extreme accuracy to be obtained by machine grooving is as yet attained by the twisting process, it is so closely approximated that for all ordinary uses the variation is imperceptible. The cost of manufacturing being somewhat lessened, the new drills can be sold at a moderate prcie.

The Norka drills are formed with correct clearance, are ground to size and are said to satisfactorily stand the rough usage incident to indiscriminate shop service. They are ground like other twist drills including the nicking of the center web. A flat shank beaded to fit corresponding grooves in the jaw of the chuck takes the place of the ordinary taper shank, and effectually prevents turning in the socket and breaking of tangs. The drill is centered at the top by a steel plug, and is securely locked in the grooved jaws with a clamping nut. Both the jaws and the centering plug are removable, and when taken out, the chuck can also be used for taper shank drills; but to protect the thread, the clamping nut should be replaced when using taper shank drills.

The Economy high speed flat drill, Fig. 3, and chuck, Fig. 4, are designed for extremely heavy feeds at rapid speeds in hard and tough high carbon steels, such as steel rails, arch bars, tool steel and steel castings. This drill is especially adapted to shallow drilling where the depth of hole runs from 1 to 3 in. Being tempered so that almost the entire length of the drill may be used there is little waste of material. It is recommended that in grinding care be exercised to keep the centerpoint as thin or narrow as on twist drills. In the special Economy chuck provided for the flat drills, grooved jaws similar to those of the Norka chuck are used. The upper end of the drill is fitted in a recessed plug which is held in place by a retaining pin inserted through holes in the barrel of the chuck as shown. There are two sets of holes at right angles to each other and staggered, bringing them close enough for all adjustments. The pin when inserted is retained by a sliding sleeve fitting over the perforated barrel. With the adjustments provided the projecting length of drill may be made as short as the work allows, reducing the torsional strain on the drill and permitting a high rate of speed without danger of breaking.

The Norka twist drills are made in all the usual sizes, from ⅜ to 2 in. diameter, with chucks of corresponding size; the Economy flat drills and chucks to accommodate them are furnished in sizes from ¼ to 3 in. diameter and in lengths up to 15 in.

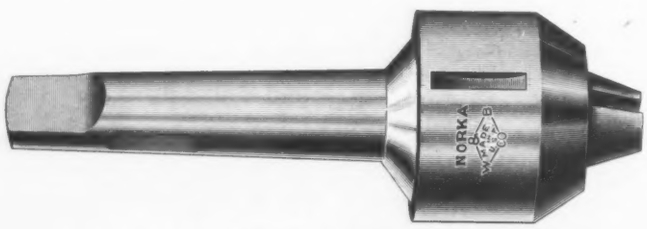


Fig. 1.—The Norka Drill Chuck.

Fig. 2.—The Norka Twist Drill.

Fig. 3.—The Economy Flat Drill.

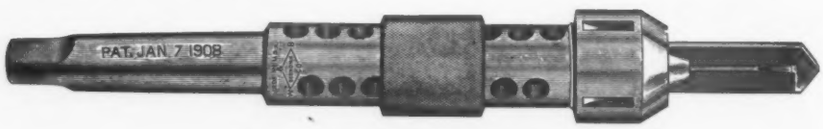


Fig. 4.—The Economy Drill Chuck.

New High Speed Drills and Chucks Made by the Whitman & Barnes Mfg. Company, Chicago, Ill.

The Growth of Our American Trade.

Trade of the United States with its American neighbors in 1907 amounted to nearly $1,000,000,000, against a little more than a third as much a decade ago, as shown by the figures of the Bureau of Statistics, Department of Commerce and Labor. To be more accurate, the total exports to all America (including in this term our own noncontiguous territories of Porto Rico and Alaska) amounted in 1907 to $490,000,000 and the imports therefrom to $448,000,000, making a total of $938,000,000. A decade ago the exports to all America were, as nearly as can be stated, $163,000,000 and the imports therefrom $205,000,000, making the total volume of trade $368,000,000, though these latter figures in 1897 do not include the trade with Alaska, which was not then recorded.

This indicates an increase of 200 per cent. in the exports to our American neighbors in the decade, and of about 120 per cent. in the imports therefrom. During that time the exports to Europe increased less than 50 per cent. and the imports therefrom 80 per cent.; exports to Asia increased 140 per cent. and imports therefrom 130 per cent.; exports to Oceania increased 109 per cent. and imports therefrom 25 per cent., while to Africa exports showed an increase of but 13 per cent. and imports therefrom increased 138 per cent.

Manufactures form a larger percentage of the merchandise exported to the American countries than most of the other sections of the world. To Canada manufactures formed 62 per cent. of the exports, basing this statement upon the official figures for 1906, the latest now available; of the exports to Mexico, manufactures formed 70 per cent. of the total; to Cuba, 55 per cent. of the total; to Argentine, 98 per cent. of the total; to Brazil, 83 per cent. of the total. Of the exports to North America as a whole, manufactures formed, in 1906, 62 per cent. of the total; South America, 86 per cent.; Europe, 27 per cent.; Asia, 75 per cent.; Oceania, 85 per cent., and Africa, 66 per cent.

The Conciliation and Arbitration Board governing the Scotch iron trade has agreed on a reduction in wages of 7½ per cent. on account of the decrease in the iron business.

The Wells Cutter and Reamer Grinder and Bench Centers.

Two new products of the F. E. Wells & Son Company, Greenfield, Mass, are illustrated in the accompanying engravings, Fig. 1 being a self-contained motor driven cutter and reamer grinder and Fig. 2 a set of bench testing centers.

As shown, the cutter and reamer grinder has a double countershaft for circular work, such as arbors, &c., and can be furnished with a complete universal equipment. The spindle is driven direct from the motor shaft, and the other end of the motor shaft drives the overhead drum, which in turn revolves the work for circular grinding by means of a small round belt. An idler which does not show in the engraving is used to keep the belt from the drum to the circular centers always at the right tension, regardless of the position of the carriage. The motor is placed where it allows the table to be swung to present the work at any angle to the wheel without interfering with any belts or the upright standards which support the countershaft. Dustproof covers are provided on the motor to keep particles of emery dust out of the bearings and armature. As plainly shown, all parts of the machine are self-contained, and no part of either the grinder proper or the countershaft has to be fastened to the wall or ceiling.

The company also builds plain cutter and reamer

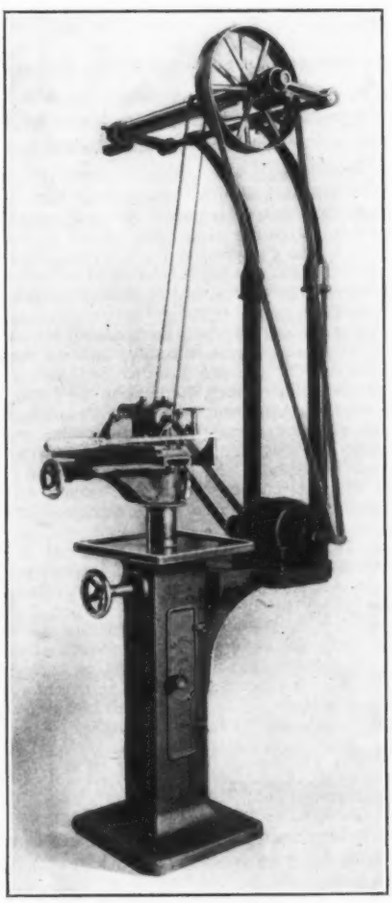


Fig. 1.—A Motor Driven Self-Contained Cutter and Reamer Grinder Built by the F. E. Wells & Son Company, Greenfield, Mass.

grinders, Nos. 164, 165 and 168, which have plain countershafts arranged in the same way as just described, except that since there is no need of a circular drum the overhead shaft is done away with and the motor is simply belted direct to the spindle, as in the case of the machine illustrated.

The new bench centers are described as strong and substantial, but still inexpensive and capable in many cases of answering the purpose of an engine lathe in testing work to find if it runs true on centers. The tail center is held in place in the center hole by a spring, so that work can be taken out and inserted quickly without making adjustments, and the spring is of the right tension to hold the piece true and at the same time allow it to revolve freely. For work of different lengths the centers are adjustable in distance from one another. In

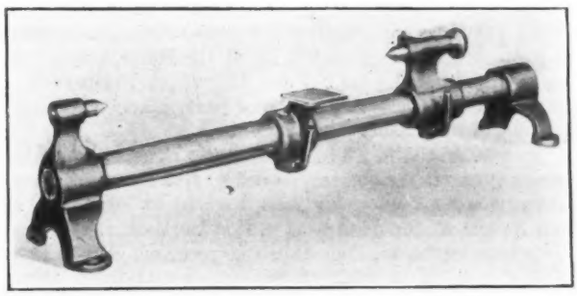


Fig. 2.—The Wells New Bench Testing Centers.

connection with the hand rest shown a test indicator can be furnished to measure the inaccuracy of the work in thousandths of an inch.

A White Star Oiling System Installation.

As a part in the economical operation of a power plant it has become the general practice to include an oil filter in the equipment, and usually in connection with a continuous oiling system to insure a positive and plentiful supply of lubricant to all bearings. The installation here described has the distinction of being located where well equipped power plants are not very common in the mining regions of south central West Virginia. The plant is that of the McKell Coal & Coke Company, Glen Jean, W. Va., operating collieries scattered over several thousand acres. Electric power is supplied by a high tension alternating current system of distribution from a central power plant, and in local substations is transformed and converted into low tension continuous current for use at the adjacent mines.

The central station contains a 500-kw. alternating current generating unit and provides space for installing a duplicate. For lubricating its bearings a White Star continuous oiling system is employed, as furnished by the Pittsburgh Gage & Supply Company, Pittsburgh, Pa., which includes a duplex type of filter and circulating pump. Overhead is a reservoir from which the oil is piped to feeds fitted to all the bearings on the engine. All oily drips from the various bearings are drained to a tank beneath the floor, from which they are returned automatically to the filter on the floor. After being cleaned in the filter the oil is pumped back to the reservoir for repeated use. Thus there is a constant flow of oil fed to all bearings, amounting in this case to a circulation of about 200 gal. per day. The reservoir is so arranged that any excess taken from it is returned through automatic valves to the filter. There is no waste, since no oil can escape from the system, except that consumed in the bearings.

The Aluminum Company of America, Pittsburgh, Pa., recently secured the very important contract for furnishing the transmission wires to be used in the electrification of the Southern Pacific Railroad Company's terminals in San Francisco. Copper is here displaced by aluminum. The contract provides that the conductors for high tension current shall be bare, and those for low tension shall be covered with ordinary waterproof insulation. This is the largest order received for such wire in the past three months.

To what extent electric mining machinery has been introduced from the United States into Mexico and has aided in a practical revolution of the entire mining industry of that country may be estimated from the fact that in one of the mining camps at Guanajuato, the Pinginco mines, no less than 250 Westinghouse electric motors are being operated, ranging in capacity from 5 to 200 hp.

The National Metal Trades Association.

Tenth Annual Convention Held at New York, March 25 and 26.

Although the tenth annual convention of the National Metal Trades Association, which was brought to a close at noon on Thursday, March 26, at the Hotel Astor, New York, was a short one, some important business was transacted, and the meeting was particularly successful in point of attendance.

As was stated in *The Iron Age* last week, the meeting was opened on Wednesday morning, and the proceedings up to noon on Wednesday were covered on page 1026 in that issue. At the afternoon session the annual report of the secretary, N. W. Dingwall, was received, and in it he gave a detailed account of the strikes and labor differences handled by the association during the year. The reports of the standing committees and of the Finance Committee were received, and they showed the affairs of the organization to be in a satisfactory condition.

Technical Education.

William Lodge of the Lodge & Shipley Machine Company, Cincinnati, Ohio, in a report for the Committee on Technical Education, reviewed the action of the association at its previous convention at Boston, leaving the question of co-operation with the Winona Technical Institute, Indianapolis, to the Administrative Council, and that body had again decided to bring the matter before the convention. Mr. Lodge recommended for his committee that the organization support 30 scholars for at least four years, the institute to furnish the buildings and machinery. He read a list of contributions from various firms belonging to the association, and said that in all $4100 had been secured from outside sources for the school. He stated that the movement had been popularly favored in the minds of the people in different localities, and the purpose of the institute, he said, was to give tuition, which would probably include elemental studies, calculated to help a boy during his apprenticeship and so arrange the tuition that a boy might earn money during some of his time. At present the technical pupils in the institute are given a moral talk 20 min. a day, and such addresses are directed toward making him fair in his judgment affecting his future employer. The curriculum is arranged so that the graduates are all round men, and the speaker called attention to the fact that in an ordinary shop boys are not taught to draw and never learn it unless in a night school.

Scholars Pay Back Cost of Tuition.

In making his appeal for the scholarships, the speaker said that the school needs $8000 more to take care of applicants on hand. He said that it takes $300 to educate a boy, and arrangements are made so that the scholar can give his note for the amount and pay it off in installments in the future. This does not make him legally responsible for the debt, but puts him on honor. He said it was the intention, if an appropriation was made, to secure about six trained machinists as tutors.

L. H. Kittridge of the Peerless Motor Car Company, Cleveland, Ohio, suggested that a scheme of assessing members pro rata might be adopted. D. M. Wright, Henry & Wright Mfg. Company, Hartford, Conn., asked where the applicants for tuition are coming from, and Mr. Lodge said that at present they are coming from the vicinity of the institute. E. F. Du Brul, Miller-Du Brul & Peters Mfg. Company, Cincinnati, Ohio, stated that the experience was that the attendance was local as with most educational institutes, and he added that members, as a rule, ought to know more about technical trade schools, most of which, he declared, do not submit their course to the approval of employers. The school in question was the only one, he thought, where the course is arranged by members.

George Mesta of the Mesta Machine Company, Pittsburgh, Pa., gave it as his opinion that trade schools should be encouraged by the association, but not supported by it, as it did not appear to him that the organization was formed for that purpose. Fred. A. Geier, Cincinnati Milling Machine Company, Cincinnati, Ohio, declared that trade schools had demonstrated the fact that they could develop workmen quicker than the shops. He declared that the organization should not only spend money for present defense, but encourage the making of efficient, clear minded workmen, and he offered a resolution that the association appropriate for the committee $3000 a year for the next four years, to be used in carrying out its plans for the Institute. Several members opposed the resolution on the ground that the association was not organized under a charter to spend money for educational purposes, and F. H. Stillman, Watson-Stillman Company, New York, pointed out that such an appropriation would doubly assess those who had contributed. E. M. Woodward, Woodward & Powell Planer Company, Worcester, Mass., declared that if such an appropriation was made he would ask for a similar appropriation for a technical school in his vicinity, and other members opposed the motion on the same ground. The resolution was finally voted down.

The convention indorsed the work of the joint committee appointed to confer with a similar committee of the National Founders' Association on matters affecting both organizations.

To Protect American Patents Abroad.

Frank S. North, Union Special Machine Company, Chicago, Ill., offered resolutions of unusual importance to American manufacturers of machinery, as follows:

Whereas, The Patents and Designs Act, 1907, of the Parliament of Great Britain provides "that at any time not less than four years after the date of a patent and not less than one year from the passing of the act (*i.e.*, from August 28 last), any person may apply to the Comptroller for the revocation of the patent on the ground that the patented article or process is manufactured or carried on exclusively or mainly outside the United Kingdom"; and

Whereas, France and Germany have passed similar laws; and

Whereas, Such laws impose excessive burdens upon American manufacturers owning patents granted by these countries, in that they require unnecessary duplication of costly plants and equipment, deprive American workmen of employment which the operation of these laws transfers to foreign workmen, and generally cause a widespread loss to the mercantile, transportation and labor interests of the United States; and

Whereas, The interchange and mutual respect of patent privileges among nations in the past is most praiseworthy and is to be favored; therefore be it

Resolved, That the President and Congress of the United States be petitioned by this association to enact proper legislation to protect American manufacturers by imposing similar conditions upon those foreign persons or corporations to whom United States patents are issued; be it further

Resolved, That the attention of the President and Congress be called to the benefits that might be derived through reciprocal agreements with such countries, relating to patents, which would modify the restrictions to the mutual advantage of the citizens of the countries interested; and be it further

Resolved, That a committee of three be appointed by the president of this association with power to act, to present this matter in the proper manner.

Several members spoke in hearty favor of the resolutions, and they were adopted without a dissenting vote. It was also decided to send a copy to the National Association of Manufacturers and ask the co-operation of that body.

The Wednesday afternoon session was adjourned early so that a caucus of the members having objection to the proposed changes in the constitution might be held and the question generally gone over. George F. Steedman, Curtis & Co. Mfg. Company, St. Louis, was appointed chairman of the caucus by President Barker, and the following morning the convention, after a short discussion, adopted a resolution providing for the appointment of a committee to gather further information on the subjects under discussion and obtain views of the members, with the purpose of bringing the matter up for a vote at some future date. The vote on the changes recommended, it was explained, was not sufficiently large either to pass or shelve the committee's recommendations.

The Annual Banquet.

The annual banquet was held in the banquet room of the hotel on Wednesday evening, and it was one of the most successful gatherings of the kind ever held by the organization. M. K. Bowman, Griscom-Spencer Company, New York, presided over the affair as toastmaster, and when the time came for the speeches of the evening he introduced Henry S. Pritchett, president of the Carnegie Foundation for the Advancement of Teaching and the National Society for the Promotion of Industrial Education, who spoke on

"Industrial Education."

Mr. Pritchett said that the organization he headed was a distinctive one, in that it has the union of practical business with technical schools. Heretofore, he explained, this country was behind foreigners in that respect, as it had not succeeded in mastering business science. Foreigners, he said, speak of industrial chemistry differently from what we do. An American chemist as a rule, the speaker declared, has his heart on chemistry, while a German chemist has his heart on business. He added that we in this country have kept our science and business separated.

"Taking it for granted that we do not equip our mechanics as practically as possible," the speaker said, "how shall we go about solving the problem? We must begin in the public schools; but just now the public schools do not lead to technical education, and the question arises as to how may the public school be equipped to be adapted to help industrial education." Continuing, the speaker described the approved system of industrial schools, explaining that in some schools the pupils work part of the time and spend part of the time in the schoolroom. All methods, he said, are worth trying, and any method that makes a boy a good mechanic is a good method. The speaker contended that a boy should be started right in the public schools and added that while too much should not be expected from that direction, the school can train a boy in such a way that he can turn his hand to an honest skilled trade. Speaking of the problem of interesting a boy in the right direction, Mr. Pritchett said that the question as to what is to be done with a boy's future is the most important between the ages of 14 and 16, and he stated that the average employer owes every boy a duty in that the lad should be given an opportunity to perfect the skill shown in development in the public schools. In conclusion, he dwelt briefly on the labor question and urged that problems be met with patience and firmness and that the association should lend its efforts, not to the cause of war, but to the cause of industrial peace.

Some Dangerous Modern Tendencies.

William H. Speer of Jersey City, who is a judge of the Essex County Circuit Court, made a stirring address on this subject. He said in part:

The first modern tendency which I consider dangerous and to which I desire to direct your attention is the tendency to hasty and ill advised legislation. There is now pending before the Congress of the United States a bill to amend the Sherman anti-trust act in order that labor unions may be excepted from its provisions as organizations in restraint of trade. In this republican government of ours there is only one kind of trade that it is not only lawful but even praiseworthy to conspire to restrain, and that is the trade between the labor union and the politician. The labor union leader approaches the politician, and, in consideration of votes which he cannot deliver or because of threats which he cannot carry out, he induces or compels the politician to give him something which is against the public good. And it seems to me that one of the especially valuable functions of an organization such as this is to see to it that bargaining of that kind shall not triumph in this country.

We read in the daily papers that this amendment is being sought because it tends to publicity in the efforts of organization, and also because it was brought about by a conference between the President of the United States, officers of the Government and the National Civic Federation. But you men know that the primary object of that legislation is not publicity at all, but is to relieve labor organizations from a restraint which the Supreme Court of the United States in promulgating an American doctrine has declared shall rest upon the shoulders of labor. And you know and I know that it is pretty near election time. And we know furthermore, that no labor organization should be permitted to masquerade under the name and guise of the National Civic Federation for the purpose of obtaining license for itself to carry on practices that are un-American.

LAW THE WILL OF THE PEOPLE.

It seems to me that the primary object that organizations of this character should keep in view is to put their hand upon the public pulse, ascertain the public will, and translate that will into law, for in no other way can American principles predominate. For what is a law? A law is nothing else than the response of the legislature to the wants of the people—not 2½ per cent. of the people, nor 5 per cent. of the people, but to the will of the majority of the people; and therefore any discrimination in favor of any class of citizens is reprehensible, un-American, and ought not to be translated into law.

Another effort that is being made is to so amend the injunction law that a hearing shall be had before a temporary restraining order shall be permitted to issue. I have had, I think, some 15 years of experience, first as a practicing lawyer, afterward as prosecutor of the pleas of my county, and now as judge; and I say to you that it is the result of my observation and experience that such a change will make for evil in this government. And I say to you that the very essence of preventive justice, which the injunction has been called by Lord Coke, is to apply a remedy to preserve the object of litigation until a hearing can be had. And if you notify a labor organization or any other organization bent upon violence, crime and intimidation; if you give it notice that you are going to apply for a temporary restraining order, the interim between the notice and the granting of the order will be a saturnalia of violence. And therefore I say that such a practice ought not to be engrafted upon the jurisprudence of this country.

THE INJUNCTION.

The injunction originated in the reign of a popular sovereign to protect the rights of common, ordinary people; it has outlasted the storms of hundreds of years in its present shape; and it is a queer manifestation of the times, but unforseen consequences always follow social movements.

If you make a law to suppress a vote, its object is defeated because you simply increase its circulation. The laws that were made for the purpose of stopping usury, instead of relieving the debtor, bore more vigorously upon his condition. And so we find that now in the times of greatest prosperity there are outcries and clamors against the present order of things. The more prosperous the times the more vigorous the outcry. It is a perverse manifestation of social progress to find agitation and clamor accompanying prosperity and development. And therefore we ought never to take these clamors and outcries too seriously at the time, but we ought to let them sink in and filter through and be thoroughly threshed over and thought over and determined upon in calmness before action shall ensue.

And if any concrete illustrations are necessary to enforce that argument, we have them before us right now. We take the decisions of the United States Supreme Court in the North Carolina and Minnesota rate law cases; we take the decision of the Supreme Court of Pennsylvania in the Pennsylvania rate law case; we take the action of Governor Hughes in refusing to put a rate law upon the statute books without due consideration. These are evidences of a healthy return to the old standards of looking before you leap and thinking before you act.

Now these are matters that will bear thought, and these are matters that will bear thought also in high places. It is not the time for any politician to lend himself to any doctrine inimical to the general welfare for a political purpose; it is not the time to do that; it is the time rather to determine upon sanity of thought and sanity of action.

THE ANTI-TRUST AMENDMENT.

To revert for an instant to this Sherman anti-trust amendment, the law was passed originally in such wise that some of the greatest statesmen we had said that no one then knew what the law meant; that the courts would have to construe it. And now what is the programme? The programme is to add to that inscrutable law a most marvelously obscure amendment, and no one can tell now whether that amendment will permit a labor union to carry on a boycott or not; and it is my judgment that probably it can. Therefore I say that laws ought not to be written in that way. Why that is little short of the old Roman method of Caligula, who used to write his laws on little cards and hang them on high pillars, the better to ensnare the people. In one you read but you do not understand; and in the other you cannot read and therefore you cannot understand. But in the ultimate analysis the result is the same.

Let us then band ourselves together as American citizens; let us demand that the laws shall say what they mean and that the courts that expound them shall not be decried but upheld; for the great foundation stone of this Government from its inception to the present time has been the Supreme Court of the United States.

Let me say that where justice lies pleading because of the assaults, whether they are made intelligently or otherwise, of those who see fit for their own purposes to decry and declaim against them, the country is being shaken in its foundation stones. Therefore, let us march forward until we have seen to it that the representatives of the people represent the people, that the laws that we write upon the statute books represent the will of the people, and then the principles of Americanism will sleep secure beneath the tents of victory upon the heights of success.

It was deemed necessary for William Lodge, after the speaking, to sing the organization's favorite ditty about "Smoke Going Up the Chimney," and then an excellent vaudeville programme, furnished through the New York and New Jersey Branch, was carried out.

THURSDAY'S SESSION.

After some routine business at the Thursday morning session Prof. Herman Schneider, dean of the College of Engineering at the University of Cincinnati, spoke on

CO-OPERATIVE ENGINEERING COURSE.

He said that the present unfitness of universities for training engineering students in a practical manner is largely due to the too close adherence to precedents going back to the monastery as the forerunner of the college. At the beginning of his work, he learned that business men demand of their technical men knowledge of the science underlying production; intimate acquaintance with the attitude of labor; a practical idea of the work to be done and a sense of business in shop operations. He made up his mind at once that the first of these requirements only could be obtained in the university, and the shop must supply the other requisites. He thereupon planned to take the university to the shop by providing for two shifts of students to alternate week by week in attendance at the university and the manufacturing plant. A six-year course is arranged for, and the student spends the summer period of four months in the shops. In this manner he spends a total of 48 months in the year in the midst of actual manufacturing operations. A high school diploma or its equivalent is required to admit a boy to the university, and a boy must begin work in the shop several weeks previous to the opening of the regular college term in order that he be given a thorough trying out.

The Survival of the Fittest Students.

The professor stated that in the first year of 75 boys who applied 45 were enrolled and 28 survived the preliminary weeding out. During the second year 800 applications were received, of which only 60 could be put in the shops, and of these 44 qualified to enter the university. The students are paid for shop work at a rate of about 10 cents an hour at first and an average increase of 1 cent an hour every six months until they earn 21 cents an hour. One of the methods of the trying out process is to start the boys during the hot summer months in wheeling sand in a foundry alongside of the common laborers, and later they are put in the machine shop, the designing department and the office, and toward the end of their term they alternate in attendance at the university at periods of every six months.

In summing up the results accomplished from these methods, Professor Schneider stated that it has been demonstrated that the average co-operative student can accomplish more in his half of six years spent in the university than the regular engineering students can in four years, and the grade of the former averages 20 per cent. better than the regulars. He quoted a chemistry test in which 90 per cent. of the co-operative students passed, against 67 per cent. of the regular students. The students are given the privilege of asking questions evolved from their shop experience, and this plan is known as the "reverse quiz." As a result of the earnest efforts of the students to get the most out of their subjects two instructors have resigned. The labor organizations, the speaker stated, are as a whole in sympathy with the school.

A Manufacturer's View of the System.

Fred A. Geier, Cincinnati Milling Machine Company, Cincinnati, Ohio, discussed the school from the manufacturer's point of view. He said that at first the men in the shops were opposed to the movement, and those in charge of departments were particularly against the scheme. When they had had an opportunity to observe the workings of the system, however, they speedily changed their minds, and he declared that students at the university who spend their working hours in his own company's shops are doing so at a profit to the company, as they are earnest and energetic, and put their hearts in their work. The speaker said that more attention should be paid to the education of mechanics, and he considered that as important as the details of any department in the plant. Labor should not be considered as a common piece of machinery, he said, and he told of an investigation he had made as to the educational condition of 40 apprenticed machinists in his shops, finding the average of them so deficient in the elements of education as to be unable to translate fractions into decimals, or read a blue print.

The condition of the average apprentice, he said, has induced his company to engage a teacher to conduct night classes, so that the boys might be instructed in the knowledge they will need as mechanics. In order to meet and counteract the tendency toward shorter hours and higher wages, the speaker declared, the efficiency of the workman must be raised, and his co-operation must be secured to keep down the cost of production. This work must be begun in the shops, and later taken up in the communities, and finally pushed throughout the country through national organizations. The Winona school was planned as a model for the country, and its foundry school has been entirely commercialized, and the castings turned out there are as good as can be made anywhere. In conclusion the speaker quoted figures showing a remarkable growth in the production of machine tools in Germany, which he attributed to the low illiteracy rate in that country and the practical nature of its educational methods. He added that it might be well to take up the social side of the question and improve the home and home influences in the interests of the workmen of the future.

Both of the speakers were tendered a vote of thanks by the association.

Advantages of Shop Experience.

Mr. Du Brul, during the discussion which followed, said that he agreed with the statement that we have not progressed to where the Germans have in technical education, and added that criticisms of the impractical methods of technical teachers are often found in the trade papers. He told of one firm he knew that would not employ a college man unless he had been broken in for two years by some one else, and referred to Professor Kent of Syracuse as authority for the statement that the pupils the Cincinnati school graduate know more than the graduate of the average engineering college six years after his graduation, because the former has been so long in contact with the shop.

Mr. Geir called attention to the fact that the first graduates will make excellent teachers for other institutions of a similar nature. In answer to a query Professor Schneider said that manual training in the high school was of no real assistance to the pupils.

Anthony B. Dunlap of Cincinnati, attorney for the association, was to have submitted a lengthy paper on "Some Recent Legislation," but as it was seen that the convention could be concluded without an afternoon session by making haste, he decided to file the paper with the secretary instead. The paper discussed laws which have recently been passed affecting trade organizations and manufacturing interests.

J. Kirby, Jr., Dayton Mfg. Company, Dayton, Ohio, presented the report of the Committee on Legislation, reciting the status of a number of measures now pending before legislative bodies.

The New Officers.

The Nominating Committee, through H. N. Covell, Lidgerwood Mfg. Company, New York, presented its report, which was unanimously adopted, and the following officers were duly elected: President, F. K. Copeland, Sullivan Machinery Company, Chicago; first vice-president, Howard P. Eells, Bucyrus Company, South Milwaukee, Wis.; second vice-president, J. H. Schwacke, William Sellers & Co., Inc., Philadelphia; treasurer, William

Lodge, Lodge & Shipley Machine Tool Company, Cincinnati. Councillors—H. W. Hoyt, Great Lakes Engineering Works, Detroit, Mich.; E. P. Robinson, Atlantic Works, Boston; W. A. Layman, Wagner Electric Mfg. Company, St. Louis, and George Mesta, Mesta Machine Company, Pittsburgh, Pa. W. H. Pfahler, Philadelphia, and M. H. Barker, the retiring president, were made honorary members of the Council. The newly elected officers were then presented to the convention. Mr. Covell spoke highly of Mr. Barker's efforts in behalf of the organization, and called attention to the fact that he had never missed a meeting of the organization. Each of the new officers made a few remarks, after which the convention was formally adjourned.

The new Administrative Council was in session until late on Thursday afternoon and again on Friday morning. Robert Wuest was reappointed commissioner, and N. W. Dingwall was made secretary for another term. The Council discussed various matters affecting the internal affairs of the organization, and at the close of the session President Copeland announced the following Administrative Council committees: Executive—Messrs. Copeland, Eells, Hoyt, and P. B. Kendig of the Senaca Falls Mfg. Company, Senaca Falls, N. Y. Technical Education—Messrs. Lodge, Pfahler, and Covell. Legislative—Messrs. Schwacke, M. K. Bowman of the Griscom-Spencer Company, New York, and Mr. Robinson. Joint Committee with National Founders' Association—Messrs. Copeland, Barker, and Hoyt; alternates, John R. Back of the F. E. Reed Company, Worcester, Mass., and Mr. Layman.

Notes.

Just before the meeting was ready to adjourn on Wednesday afternoon, Mr. Du Brul arose and on being asked by President Barker to cut his remarks short, he good-naturedly refused to be ruled out, and proceeded to make some eulogistic remarks on the president's zeal for the organization. He finished by asking for three cheers for President Barker, and the convention got on its feet and cheered accordingly.

The ladies were not forgotten in the social arrangements, and under the auspices of the local branch of the association they had a dinner and theater party on Wednesday evening.

On Wednesday afternoon a number of the members accepted an invitation to visit the building of the Metropolitan Life Insurance Company, which, when finished, is to be the tallest in New York.

There was a good representation of local machinery and supply dealers at the convention, and many of the manufacturers made it a point to spend their spare time on Thursday afternoon in visiting the trade here.

Water Power Development on the Border.

Cecil B. Smith, consulting engineer, Toronto, Canada, delivered the principal address at the twelfth anniversary of the granting of the charter of the Clarkson School of Technology, Potsdam, N. Y., March 14. He was engineer in charge of construction of the Canadian Niagara Power Company from 1901 to 1904, and chief engineer of the Hydro-Electric Power Commission of Ontario from 1905 to 1907, and was therefore splendidly qualified to talk on the subject of the development and utilization of water powers.

The United States, Mr. Smith said, has more fully developed its water powers than any other country, largely through the diversity of its climate. Canada's water powers come next in order, where 400,000 hp. has been developed; and next to that stands Italy. He had the pleasure of examining the water powers of Italy a few years ago, and brought back the highest regard for the Italian engineers. He said that he returned to Canada very much humbled, after seeing the wonderful progress that foreign engineers had made in developing water powers for manufacturing purposes.

He touched on the great natural resources of Canada, but deplored the fact that in the most populous parts of the Dominion no coal is to be found. Therefore, he said, dependence must be placed upon shipments by rail of coal from distant points, whether in the United States or Canada, for heating and power purposes. It will easily be seen that in the lower central and lake provinces every effort should be put forth to make the most of the natural resources there abounding, namely, the almost unlimited water powers.

At the Long Sault, for instance, near Massena, N. Y., there are developments projected something like 700,000 hp. Although Mr. Smith would hesitate to say that a dam would ever be built across the St. Lawrence River, nevertheless to do so would result in untold benefits to both Canada and the United States. If it should be the case that the International Conference gives permission to place a dam across the Long Sault, thereby making it necessary for all the lake shipping vessels on their way to the sea to go through canals, there would be one of the greatest hydroelectric developments in the world at our doors, as great, in fact, as Niagara Falls, because the respective governments have already limited the amount of water to be taken out for power purposes at Niagara.

The Medical Air Lock for Compressed Air Victims.

The workmen and staff of S. Pearson & Son, Inc., who have just completed the excavation for the Pennsylvania East River tunnels, on March 20 presented to E. W. Moir, vice-president of the Pearson Company, a very interesting model of a medical air lock, with the following inscription: "Presented to Mr. E. W. Moir, the maker of the first medical air lock on the old Hudson Tunnel, 1890, by grateful 'sand-hogs' on the Pennsylvania East River Tunnels, New York, 1908." The model is made of brass, oxidized to look like steel, is mounted on mahogany and has a silver name plate. It is built to a scale of 1½ in. to the foot and measures about 2 ft. 6 in. long by 9 in. in diameter. It is complete in every respect, being lit with electric lights and the compressed air being supplied by an air pump. The hospital beds for the men to lie on and the compressing and decompressing valves, along with thermometers and pressure gauges, are shown in full detail. The model was made by H. E. Boucher, New York. The presentation was made in the yards of S. Pearson & Son, Inc., in Long Island City. Henry Japp, the local manager for the Pearson company, tendered the salutation of the occasion.

Mr. Moir built the first air lock ever constructed, in 1890, and this model is a mark of the appreciation, regard and gratitude of compressed air workers to the man who has done so much to relieve them of the dangers of their calling. He was employed by S. Pearson & Son, Ltd., on the old Hudson Tunnel, in 1889, and successfully built a shield 2000 ft. from the shore and drove a little over 2000 ft. of tunnel at a final rate of 10 ft. per day. It was this same shield, which Mr. Moir left in good shape more than half way across the Hudson River, that Mr. McAdoo and Mr. Jacobs ultimately pushed through to Manhattan.

The importance of the medical air lock in tunnel work is little understood. In the building of the East River tunnels there have been at least three cases of men who, to all intents and purposes, were dead, but after being treated in the medical air lock have fully recovered. Similarly, there have been cases of men who, to all intents and purposes, were paralyzed, and who were thoroughly restored to their normal condition in the medical air lock. There are six medical air locks in the East River tunnels, for the use of engineers and workmen, these being all fitted with a double chamber, so that the medical officer can pass in and out to his patients without interfering with or interrupting the decompression.

With a view to concentrating its operating forces, the Colorado Fuel & Iron Company, Denver, Colo., is transferring the manager of the fuel department, the manager of the iron mines department and the engineering staff connected with these departments to Pueblo, Colo., where its steel plant is located. This change will bring the entire operating forces of the company in its own office building at that place.

Malleable Cast Iron.*

A Comparison of "Black Heart" and Old Process Castings.

BY WILLIAM HERBERT HATFIELD.

The first description of the method of making cast iron malleable is due to Reaumur. He published in 1722 "the fact that the heating of cast iron castings embedded in red oxide of iron softens the metal perfectly and much more rapidly than all the other matters which he had tried." Practically the identical method described by Reaumur is at the present time in operation, and is producing a large quantity of the malleable cast iron consumed in Great Britain. It is strange that Samuel Lucas should have been allowed to patent in 1804 a process which obviously was so well known practically a hundred years previously, but such is the case. Of later date there has been developed another process for making malleable cast iron which is called in America the "black heart" process. Before going into the difference in the two varieties produced, it might be well to describe what malleable cast iron really is.

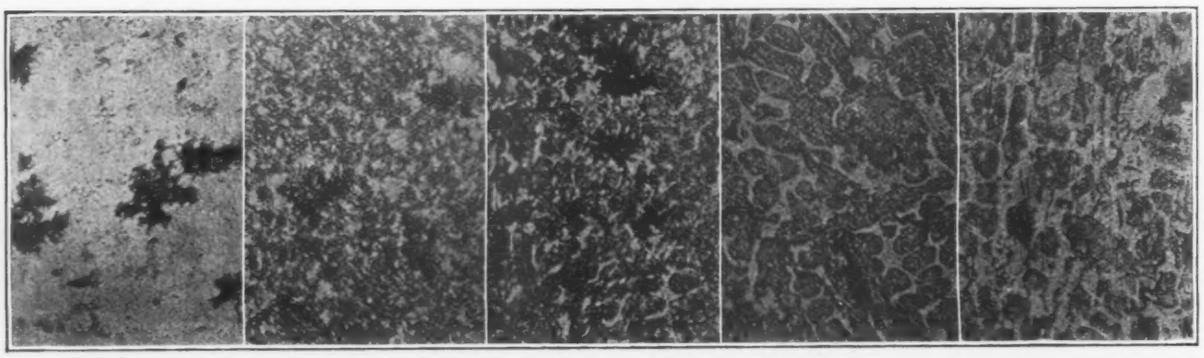


Fig. 1.—White Cast Iron, Showing Microstructure of the Two Carbides.

Fig. 2. Intermediate Structures.—Etched Magnification, 120 Diameters.

Fig. 3.

Fig. 4.

Fig. 5.—Microsection of White Iron After Being Converted Into Malleable Cast Iron, Showing the Structure of the Free Carbon.

It consists of castings made by melting suitable pig iron and casting it into the required forms, which castings are, of course, annealed in order to produce the requisite malleability. The finished article, if successfully manufactured, possesses all the advantages of cast iron in that the low melting point of the pig iron allows the most intricate and difficult casting to be made, and these castings have the same beautiful skin and finish for which cast iron is so well known. As a further fact it may be said that this material is practically free from blow holes, the composition of it ensuring the perfect occlusion of the gases which in a steel casting very often cause so much trouble. As regards the physical properties, it is malleable and ductile and is easy to work in the machine shop.

All malleable cast iron when cast is identical in analysis with some variety of pig iron, having present in its composition from 3 to 4 per cent. of combined carbon, which gives it that intense hardness found in the unannealed casting. The malleableizing of the material is done either by the oxidation and elimination of the carbon or by precipitating it into such a condition that it does not militate against the production of the qualities desired.

European and American Practice.

Certain specific conditions are, of course, necessary for the production of this material when the carbon is merely changed in form, and as the irons from which the malleable castings in this country and Europe are made are generally extremely high in sulphur, not being able to change the form, manufacturers in the past have had to eliminate the carbon. Consequently the method employed is that of Reaumur, namely, packing the castings with iron ore which oxidizes and eliminates the carbon to such an extent that the casting has attained that degree of malleability which is desired, the fracture of such casting being very similar to that of steel.

The malleable castings produced in America are of the black heart variety, and generally speaking the American process consists of precipitating the carbon and not eliminating it. These are castings which, in the finished state, have the same composiiton as pig iron, and which bend double and fulfil the most stringent malleable cast iron specifications. Owing to the natural resources of America producing a pure iron with very little sulphur, the secrets of the manufacture of black heart castings were quickly learned, and this industry to-day produces from 700,000 to 1,000,000 tons of malleable castings per year.

In the first place, the iron in both the American and the European malleable processes was melted in the crucible; the next stage was to melt this iron in cupolas as larger quantities were required, and as purity became more essential the reverberatory and the open hearth furnaces came into play. The methods of annealing, of course, have been considerably improved. During the last 20 or 30 years the system of producing malleable similar to the American black heart has been developed. The author is at present actively engaged in producing both varieties, each having different qualities and therefore applicable to its own sphere of utility. The original malleable cast iron produced in Europe, the Reaumur, has a steely fracture, and is obtained by oxidizing the carbon contained in the original casting by hematite iron ore. The other, called by one English manufacturer "special" malleable, is produced merely by changing the form of the carbon.

Most of the malleable castings in Europe are of the Reaumur type. The castings are packed in cast iron boxes in hematite ore and taken to a heat at which the ore commences reaction with the carbon in the castings. This action is the converse of the production of steel by cementation, in which process the carbon enters from the outside and gradually permeates the whole bar. In the Reaumur process exactly the contrary takes place, and the carbon is gradually eliminated from the outside first, so it follows that the interior of one of these castings has generally considerably more carbon than the outside. If successfully manufactured, however, the carbon in the center is in such a condition as not to militate against its working capabilities.

The Decarbonizing Action.

The actual chemical reaction which takes place between the iron ore and the carbon in the iron is not as yet sufficiently understood. However, it is known that gases easily diffuse through metals of the iron group in considerable quantities, and it is most likely that the action is somewhat dependent on the equation $CO_2 + C = 2CO$. In other words, the oxygen of the ore oxidizes the first carbon to CO_2, and this carbon dioxide possibly combines with more carbon, forming CO, which in itself receives further oxygen from the iron ore, and so what might be called catalytic action takes place, in which the

* From a paper read before the Institution of Engineers and Shipbuilders in Scotland, March 17, 1908.

CO is the carrier of the oxygen from the ore to the carbon contained in the interior of the castings. Such explanation seems as likely as any other at present put forward. This variety is very much like some grades of steel. The photomicrograph, Fig. 6, shows the constitution of this metal as seen by the high power of the microscope. It consists chiefly of well laminated pearlite distributed through a ferritic matrix.

A few weeks ago the following abstract from a paper read before the Scandinavian Technical Society, regarding the strength of malleable castings as made in the Scandinavian Peninsula, was published in one of the technical papers:

The paper gives the tensile strength as between 40,000 and 50,000 lb. per sq. in. It has an elongation varying with different samples from 1 to 6 per cent., with a reduction of area at the breaking point of from ¾ to 3 per cent. It is thus seen that the ordinary grade of cast iron having a tensile strength of 20,000 to 30,000 lb. per sq. in. is but half as strong as malleable castings, though its compressive strength is much higher.

Obviously the malleable castings described are of similar type to the Reaumur, and the above appears to be a fair statement of the mechanical tests which this type of malleable will give. The similarity between this material and steel is very much in evidence on comparing the microstructure, and it seems remarkable that, while the elongation and reduction of area of this type of casting are so low, it can not only be hammered and bent to a very considerable degree, but it will harden, temper and forge, if properly made.

The Carbon Change in Annealing.

However, it must be confessed that while this material has great malleability and great working powers, and is extremely useful for parts where wear and tear take place, it does not produce anything like the tests which the author has obtained by the development of the black heart type. Attention was first seriously drawn to the development of this special malleable by the requirements of the British Admiralty. Their specification, by the way, is 18 tons to the square inch, a minimum elongation of 4½ per cent. in 3 in., and a bending angle of at least 90 degrees over a 1-in. radius, the bar being 1 in. x ⅜ in. in section. The variety of malleable casting known as American black heart has for its essential ditsinction the fact that the castings when cast are of such a composition that the carbon, which previously exists as combined carbon, is by annealing completely changed to that condition of carbon known as annealing carbon, to which Ledebur, the German metallurgist, gave the name of temper carbon.

The author in May, 1907, went thoroughly into the question of the change of the carbon, in a paper read before the Iron and Steel Institute, under the heading "Decomposition of Carbides," and he thinks this change can be best explained by reference to some of the photomicrographs given in that paper. These are five in number, Figs. 1 to 5, the first being the hard initial casting, while the last is the completely softened finished one. Fig. 1 gives the typical structure of cast iron. All the carbon is in the combined state, the carbon of "supersaturation" being present as carbide Fe_3C, while the carbon of "saturation" is present as a compound roughly equivalent to $Fe_2 4C$. The castings are heated up during the annealing process to the temperature required (this, of course, differs with different makers), maintained for a varying period at this temperature and then cooled. The result is a casting in which the carbides are completely broken down into pure carbon and iron. Fig. 5 clearly illustrates this. Figs. 2, 3 and 4 show the intermediate appearances of castings while the change is taking place.

Reference will now be briefly made to wrought iron, which is prepared by eliminating in the plastic condition, by means of oxides, the carbon and other impurities from pig iron. The result is pure iron, with traces of sulphur, phosphorus, manganese and a little carbon with a varying proportion of slag, the slag being mechanically contained in the iron. Wrought iron of the best make is as pure as iron can commercially be made, and every one is familiar with its great ductility and malleability. Apart from iron, the only content of this material worth considering is the involved slag which, during the rolling out of the iron, is drawn into threads running the length of the bar, and gives to wrought iron that peculiar fibrous nature of the fracture. Of course there is no such thing really as fiber in iron products, as they are all crystalline.

Fig. 7 represents a longitudinal section of wrought iron which shows the crystalline structure of the pure iron along with a longitudinal section of the slag threads. It is obvious that this slag is practically of no detriment to the high properties of wrought iron. Wrought iron forgings, were it not for their high cost, are unquestionably excellent, and in working upon the subject of malleable cast iron, wrought iron forging has been taken as a basis, the endeavor being to produce in a malleable casting a structure as similar as possible.

Malleable Castings with High Strength.

The maximum stress in wrought iron is approximately 20 to 21 tons per square inch, and its elongation will vary from 20 to 30 per cent. Now, if against this the test previously given for malleable cast iron is placed, namely, about 20 tons tensile strength with 1 to 6 per cent. elongation, it will be noticed that there remains considerable scope for improvement in the last mentioned product. Working on these lines, bars have been produced giving a tensile strength of 23 tons along with 19 per cent. elongation, 20.6 reduction of area, along with 180 degrees bending angle. Table 1 is made up from a test sheet containing the results obtained from these castings. Material such as that of which the tests have just been given, and which is, of course, a casting and not a forging, is, one might almost say, a new product. The old tests for malleable cast iron have been left far behind, and a ma-

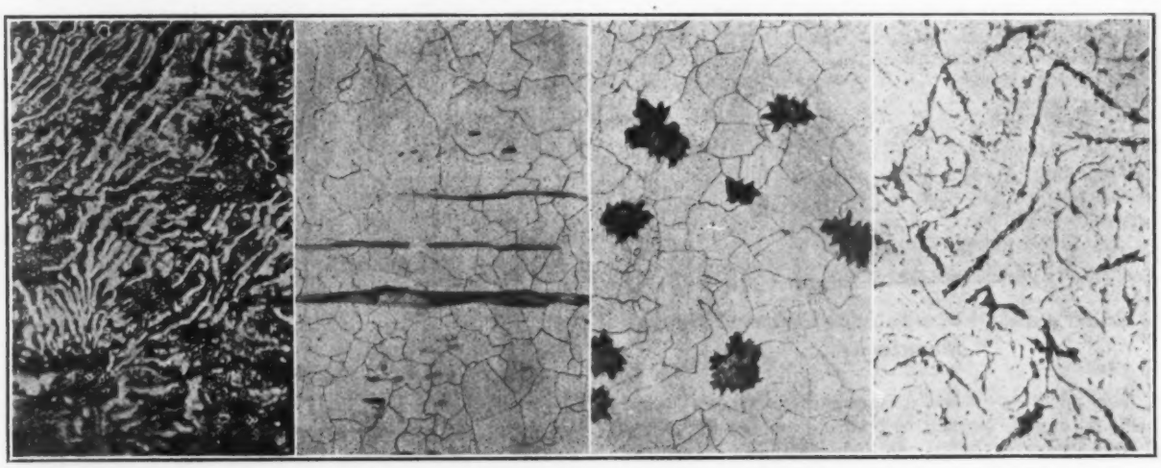


Fig. 6.—Microstructure of Reaumur Malleable Cast Iron.—Magnification, 350 Diameters.

Fig. 7.—Longitudinal Section of Swedish Wrought Iron Under the Mircoscope.—Magnification, 90 Diameters.

Fig. 8.—Microstructure of Black Heart Malleable Cast Iron.—Magnification, 90 Diameters.

Fig. 9.—Microstructure of Gray Cast Iron, Showing Plates of Graphite.—Magnification, 45 Diameters.

terial has been produced which has before it a much greater field than the original malleable cast irons.

Table I.—Tests of Special Malleable Castings.

Test No.	Original dimensions. Size in inches.	Original dimensions. Area. Sq. in.	Fractured dimensions. Size in Inches.	Fractured dimensions. Area. Sq. in.	Fractured dimensions. Elongation. inches.	Maximum stress. On section. Tons.	Maximum stress. Per sq. in. Tons.	Elongation. Per cent.	Reduction of area. Per cent.
24,137	1.010		0.93						
	0.385	0.389	0.35	0.326	0.46	8.85	22.75	15.3	16.2
24,138	1.010		0.93						
	0.390	0.394	0.35	0.326	0.54	9.15	23.22	18.0	17.3
24,139	1.010		0.91						
	0.385	0.389	0.34	0.300	0.58	8.92	22.93	19.3	20.6

These special castings are very similar in structure to wrought iron. Microscopically they consist of ferrite, which is pure iron, with free carbon in such a form as will be obvious by the results obtained to be little more detrimental than the slag which is found in wrought iron; in fact, samples of wrought iron have been met which have not given much better results than the tests submitted in this paper. It will be well to conclude by asking whether malleable cast iron with the properties and tests as stated is not entitled to a much higher position in the metallurgical world than it is given, and the author would venture to suggest that the "Nomenclature" Committee gave malleable cast iron undeservedly short shrift when they stated that it merely lacked "the extreme brittleness of cast iron."

The demand for malleable in this country as compared with that of the United States gives food for thought. The Americans are said to be producing over 90 per cent. of the world's production, Europe only producing the remaining 10 per cent. Here in this country, a material giving tests considerably superior to those obtained in the States is produced, and yet this selfsame material is excluded from many purposes for which in the States it would be allowed to be used. The following table gives the comparative results which are now being obtained:

Material.	Maximum stress. Tons sq. in.	Elongation. Per ct.	Reduction of area. Per ct.	Bending angle. Deg.
Cast iron	12.0	Nil.	Nil.	Nil.
Old process malleable (Reaumur)	21.0	3.0	4.0	45
American Blackheart	19.0	5.0	6.0	90
Special malleable (Meadow Hall Ironworks)	23.0	14.0	17.0	180
Admiralty specification	18.0	4.5	..	90

It will be noticed that in the special malleable the maximum stress is very high, while the ductility much surpasses that of any other malleable cast iron. One obvious feature will be the ease with which this material passes Admiralty requirements.

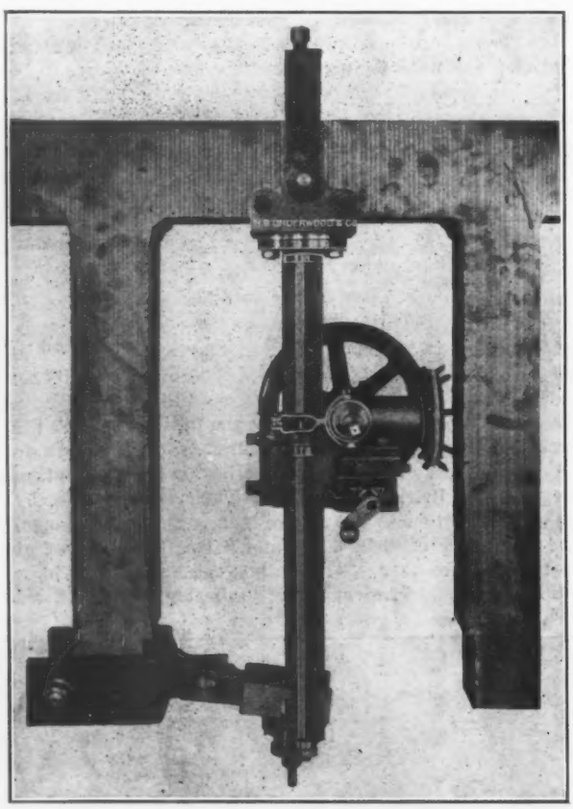
The Underwood Locomotive Pedestal Facing Machine.

A new portable power driven equipment for facing the pedestal legs of locomotive frames has been developed by H. B. Underwood & Co., Philadelphia, Pa. Its parts and the manner of working are plainly shown in the illustration, which represents it as applied in the facing of the vertical side of a set of pedestal jaws. The frame of the device is a square bar secured at each end by clamps to the frame and parallel with the work. The support of the upper end is a steel swivel, which allows the cutting tool to be positioned squarely with the angular side of the jaws as well. The top of the swivel is a large surface which clamps firmly to the frame, and is easily changed for a smaller one when the device is to be used in a constricted space. The lower clamping member is universally adjustable to hold the bar firmly at any angle.

In one side of the square vertical bar, which is also the guide on which the milling head slides, is a square thread feed screw. The head has a bronze half nut engaging this screw, which is operated for the feeding by a ratchet and pawl and an eccentric on the shaft driving the milling head. The feed is thus automatic, and is variable to suit the requirements. The milling head has two adjustments, from and toward the work and across its face. These allow both fine and quick adjustments, making it unnecessary to loosen the supporting clamps after they are once set. The adjustments are through screws, for the operation of which an interchangeable crank handle is furnished.

The milling spindle is driven through bevel gears from a telescopic shaft with universal joints at each end, affording the connection directly to the power source, and consequently eliminating any belts in connection with the device itself. An electric motor may be used or a small countershaft belt driven from a convenient line shaft. A very complete rig for driving this and the company's other portable tools is a two-cylinder air or steam motor, which is furnished when desired.

The milling spindle is threaded to receive the milling



A Portable Machine for Facing the Pedestal Jaws of Locomotive Frames, Made by H. B. Underwood & Co., Philadelphia, Pa.

cutters, which are made with inserted square high speed teeth, removable for grinding and adjusting. A large quantity of metal can be removed in a short time, not by one pass, but by taking several light cuts, as only a brief time is consumed in each transit.

Oglebay, Norton & Co., Cleveland, Ohio, send out their iron ore handbook for 1908, containing analyses and guarantees of the various ores they will handle this year—seven from the Gogebic range, six from the Menominee range and one each from Canada and the Cascade District of the Marquette range. The firm's Moose Mountain ore, from the Sudbury District, Canada, is offered as of the same analysis as in 1907, except that silica is 12.79 per cent., as against 13.29 per cent. formerly. This ore is crushed to 2-in. size and runs 55.50 per cent. iron and 0.10 per cent. phosphorus.

The Aldrich financial bill to provide for an emergency issue of taxed currency notes in time of money stringency was passed by the Senate March 27 by 42 ayes to 16 noes. In substance it authorizes national banks to issue such notes on depositing collateral of United States or State bonds or the bonds of certain described counties and municipalities, these notes to be subject to a progressive tax which will compel the banks to withdraw them from circulation when the emergency has passed.

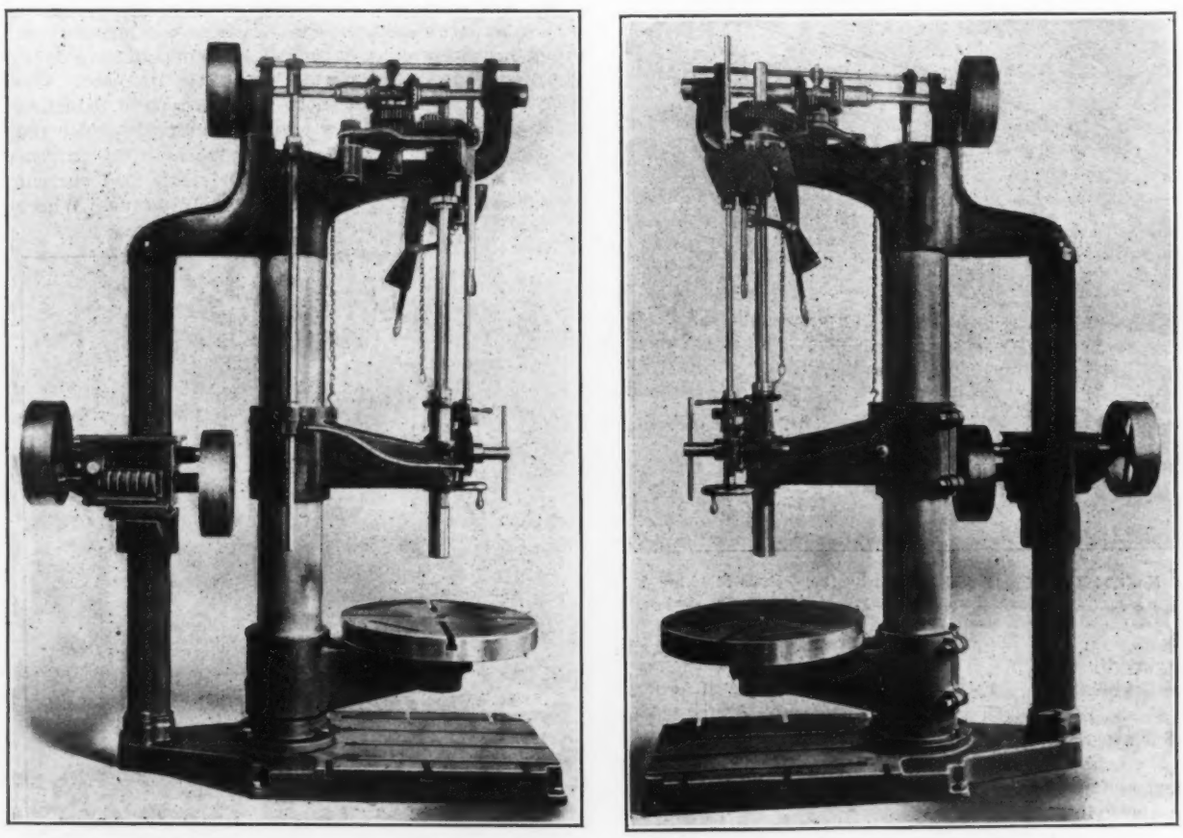
The New Hilbert Triple-Geared Upright Drill.

For so important a tool it is strange that the upright drill has been so little improved in the last few years. The older forms are generally open to the following criticisms: The spindle stock is not sufficiently rigidly secured to the column for accurate work; too much work is put upon the bevel gear drive in proportion to the back gears which are usually of 1 to 2 or 1 to 3 ratio; the transmitting shafts have to run two or three times faster than the spindle, resulting in more rapid wear and often noise; when tapping attachments are provided they are too frequently placed disadvantageously to be really powerful; and the friction clutch in the transmission, in its common location directly associated with the spindle, has not the aid of the ratio of speed reduction between the driving shaft and the spindle.

The above objections are among those which it has been sought to remove in the new triple geared upright drilling machine built by the Hilbert Machine Company, Cincinnati, Ohio, and illustrated herewith. Its round column is large and terminates at the bottom in an extended flange, which is bolted to the heavy ribbed T-slotted base. Still greater rigidity is secured by the columnar back brace which connects the top housing and the base, the four members forming substantially one solid piece. This secondary column carries the speed changing mechanism through which the power is delivered from a large single step pulley. Because of this single pulley drive the machine may be set either parallel with or at right angles to the line shaft. The speed variator is simple and, with its single operating lever, affords six changes in speed, ranging in geometrical progression. Near the spindle the six speeds are tripled by gears manipulated by a hinged lever provided with a locking pin. This lever is in front of the operator and enables three series of spindle speeds to be obtained instantly; one for high speed drilling, one for medium speed and one for heavy drilling and boring, six speeds in each series. The spindle has two gears, a large one of coarse pitch and a smaller one of fine pitch for high speed. There are no running idle gears; when any set is in action the others are disengaged. The provision of the extra gear at the spindle for high speeds removes the necessity of ever running any shaft at greater than a moderate speed.

All of the principal gears are of steel and are carried in phosphor-bronze bearings. The belt which transmits power from the speed variator to the top shaft introduces a yielding link in the transmission by its slipping, when the drill is unduly crowded and thus eliminates considerable danger of breakages.

The tapping attachment, with which each machine is supplied, is favorably located on the shaft which affords the greatest power and is conveniently accessible to the operator. Two miter gears provided with band friction clutches, adjustable for wear, connect it with the drive. These clutches have the property of increasing their hold as the load increases. A conical sleeve causes one or the other of these friction bands to engage the corresponding miter gear to give backward or forward rotation to the spindle as desired. The controlling lever is easily within reach of the operator to stop, start or reverse the spindle. The latter may be done at any speed. The friction clutches by years of use have been demonstrated to be reliable and to require no adjustment for wear.



Views from Opposite Sides of the New Triple-Geared 36-In. Upright Drill Built by the Hilbert Machine Company, Cincinnati, Ohio.

The automatic spindle feed is positive, powerful and gives four changes of speed easily and quickly accomplished. Hand feed and quick return and approach movements are provided for the spindle, and an automatic trip which is sensitive and does not depend much upon the pressure on the spindle.

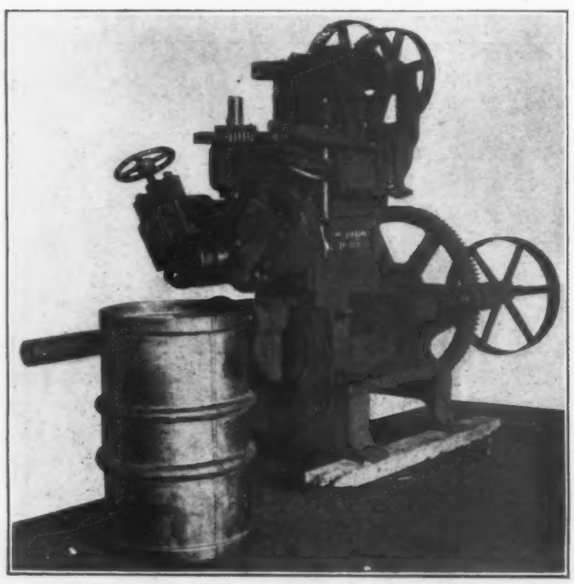
The front arm or spindle stock has long bearings and surrounds the column completely. It slides down on the latter to the top of the table arm, where the spindle will nearly touch the base. This feature allows omitting an inconvenient raising and lowering mechanism for the heavy arm and table. The spindle and table arms are of box girder section and of similar pattern. Each is clamped securely to the column by two strong screws, and with the extra support maintained by the back brace perceptable deflection of either arm, it is claimed, would

not be shown by the severest test. The gears are proportioned to allow for performing the heaviest work at maximum speeds with high speed steels.

The following are the principal figures: Floor space, 30½ x 80 in.; hight, 112 in.; weight, 3800 lb.; distance from center of spindle to face of column, 18 in.; diameter of table, 30½ in.; greatest distance between base and spindle, 56¾ in.; between table and spindle, 37½ in.; traverse of spindle, 15 in.; diameter of spindle at lower end, 3⅜ in.; in sleeve, 2 3-16 in.; above sleeve, 2 1-16 in.; socket in spindle, No. 5 Morse taper; diameter of column, 10 in.; size of driving pulley, 4 x 16 in.; speed, 250 rev. per min.; changes of speed, 18; changes of feed, 4—0.006, 0.01, 0.018, 0.03 per revolution of spindle.

A New Toledo Swedging Machine.

A new machine design for swedging or rolling the large beads on steel oil barrels and the shoulders at each end for supporting the heads or ends is shown in the accompanying illustration. The machine is fitted with two parallel shafts connected at the rear end with gears. These shafts support the upper and lower swedging rolls, which are made of tool steel and hardened.



The No. 336 Swedging Machine Built by the Toledo Machine & Tool Company.

The cylinders are first prepared in their plain, smooth shape and placed in position on the machine, guided by the apron in front of the machine, which is adjustable. The machine is fitted with an automatic lifting attachment operated by a reverse clutch mechanism, which necessitates only the starting by the operator. The upper shaft or head descends automatically to the work and finishes the swedging or rolling of the beads, when the clutch is automatically reversed by striking a stop, which is set to the correct position at the lower end of the travel of the head. This stop reverses the lever, which throws the clutch mechanism to the opposite side when the head is elevated to the required hight, where it is stopped automatically.

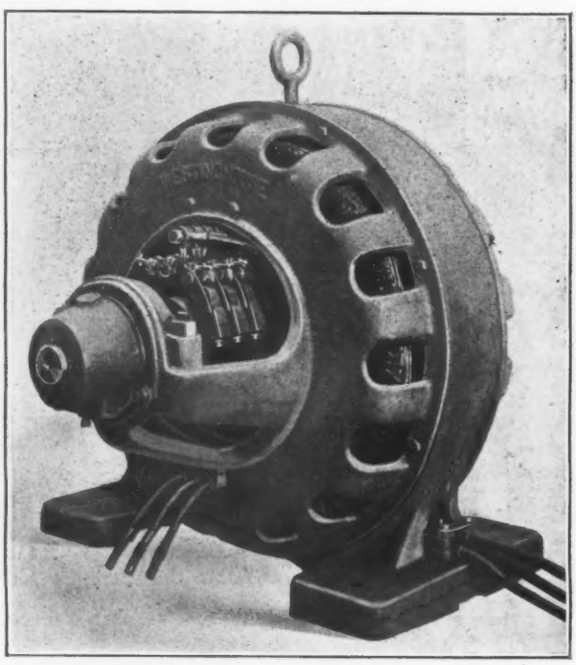
It requires about 1 min. to roll or swedge each bead or shoulder, and the machine, therefore, has capacity for finishing at the rate of about 30 cylinders or barrels per hour. The machine has capacity for working metal as heavy as No. 14 gauge, varying in diameter from 12 to 36 in. It is known as the Toledo No. 336 swedging machine and is designed and built by the Toledo Machine & Tool Company, Toledo, Ohio.

This week the Bessemer steel plant, 20 puddling furnaces and No. 2 skelp mill of the Youngstown Sheet & Tube Company, Youngstown, Ohio, are on double turn, while No. 3 skelp mill is running single turn. The sheet mills and No. 1 skelp mill are off this week. The plant of the Morgan Spring Company at Struthers, recently bought by the Youngstown Sheet & Tube Company, embracing rod and wire mills, is running double turn in all departments.

A New Westinghouse Induction Motor.

The first polyphase motors were of the brushless or squirrel cage type, and compared in their characteristics with shunt wound direct current motors. Now the high starting torque with a low initial current peculiar to a series wound direct current motor have been approximated by the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., in a modified form of alternating current motor, type H F. The illustration shows its general appearance. It is designed throughout for severe service. The frame, although affording ample ventilation, is strong and substantial and protects the laminations from injury. The insulation on the coils is made equal to much greater stresses than it is ever expected to receive, and the wearing effect of vibration has been guarded against.

By means of the brushes shown, connection is made to an external resistance. These bear on continuous rings of metal, hence are not subject to sparking, and are liberally proportioned for long life and little attention. The rotor is unlike the usual short-circuited type of induction motor armature, and has a regular winding in which the resistance is inserted while starting, to limit the current supplied at that time. Approximately full load current is required to produce full load starting torque. Where it may be desired semi-inclosing covers are provided to protect the brushes and slip rings from coarse foreign bodies, or fully inclosing covers to exclude even dust.



An Example of the New Alternating Current Motor Built by the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.

The motors are regularly built in the usual sizes, from 5 to 500 hp., and larger sizes on order. The standard frequencies are 25, 40 and 60 cycles, but motors for other frequencies are furnished when required.

Special starting devices are supplied with these motors, for varying the starting current by hand by cutting out the resistance in circuit with the armature. When the motor is up to speed all of the resistance is short circuited and the motor runs with practically the constant speed characteristics of a motor with a squirrel cage armature. Motors of 100 hp. or larger can be provided with a special switch to short circuit the windings inside of the motor and relieve the brushes and the leads and contacts of the starter.

The Heald Manufacturing Internal Grinder.

The internal grinding machine illustrated is designed for general manufacturing use in the grinding of round straight or taper holes in pieces that can be rotated. The machine, which is built by the Heald Machine Company, Worcester, Mass., has a number of special features, as well as several radical changes from the hitherto accepted design of its general type. Especially noteworthy is the mounting of the grinding spindle directly on the main table, and the headstock on a heavy bridge casting that permits the passage of the table underneath, constituting a massive and rigid construction. Another new feature is the self-contained and interchangeable wheel heads. The driving pulley of each is proportional to the diameter of the grinding wheel, thus automatically giving the correct speed for all sizes of wheels. The cross slide is operated either by hand wheel or by automatic feed ranging from 0.00025 to 0.003 in. at each reversal of the table. In addition to the wheel feed a finger lever provides the operator with hand micrometer feed, each movement of the lever causing the index wheel to rotate a single notch, advancing the grinding wheel 0.00025 in.

Five speeds of rotation of the work are obtained through a quick change gear box mounted as a part of the countershaft, and three speeds of table travel for each of the five work speeds through the quick change gear box seen at the left on the base, giving fast travel for roughing out stock and slower speeds for truing and finishing. At the right on the base is the automatic reversing gear box. This and the other two gear boxes have been described in detail in *The Iron Age*.* The machine shown in Figs. 1 and 2 swings 14 in. and grinds 11 in. deep. The diameter of the smallest hole ground is ⅞ in., and the largest 10 in.

Internal grinders are becoming perforce more generally used. They are succeeding reamers for many purposes, and for parts too large for reaming there is no other substitute if work is to be exact. Where a piece of work has thin walls it is very difficult to hold it for reaming without distortion, while for grinding it can be strapped to a face plate avoiding this danger. There is also an advantage in being able to face work at the same setting with the grinding of the hole, as, for instance, a shoulder at the bottom of the hole, or the face of a ring or collar. This may be done on this internal grinding machine by using the face of a cup wheel instead of the periphery as in internal grinding. It is frequently of advantage to be able to make the hole and the face accurately square, one with the other, and if distinct operations are made of these, as transferring from grinder to lathe, or vice versa, accuracy is dependent entirely upon the precision of the chucking, which may not be within the limit of error allowed.

The departure of mounting the grinding spindle on the machine table, instead of behind it, reaching up and over it, contributes to rigidity, enabling the operator to take heavy cuts with a free cutting wheel; the absence of vibration also maintains the texture of the abrasive wheel. The main table is long and heavy, with wide bearings to insure good wearing qualities. Guards protect the ways from grit or dust, and oil pockets and rolls distribute oil uniformly.

The headstock, mounted on a bridge over the table, is arranged to swivel to various angles for grinding taper holes, and is graduated in degrees and in inches taper per foot. It is a heavy casting, and the chuck spindle is made of a special grade of high carbon steel, ground and lapped and of large diameter. Details of the head are shown in Fig. 3. The bronze bushings *a* are tapered outside, and have straight bearings. The adjusting nuts for the bushing are shown at *b*, the dove tail wedges to seat the bushing in the head at *c* and their adjusting screws at *d*. The hardened check nuts to take up end play are at *e*, and opposite them is the hardened thrust collar *f*. The hardened stud on which the head swivels is shown at *g*.

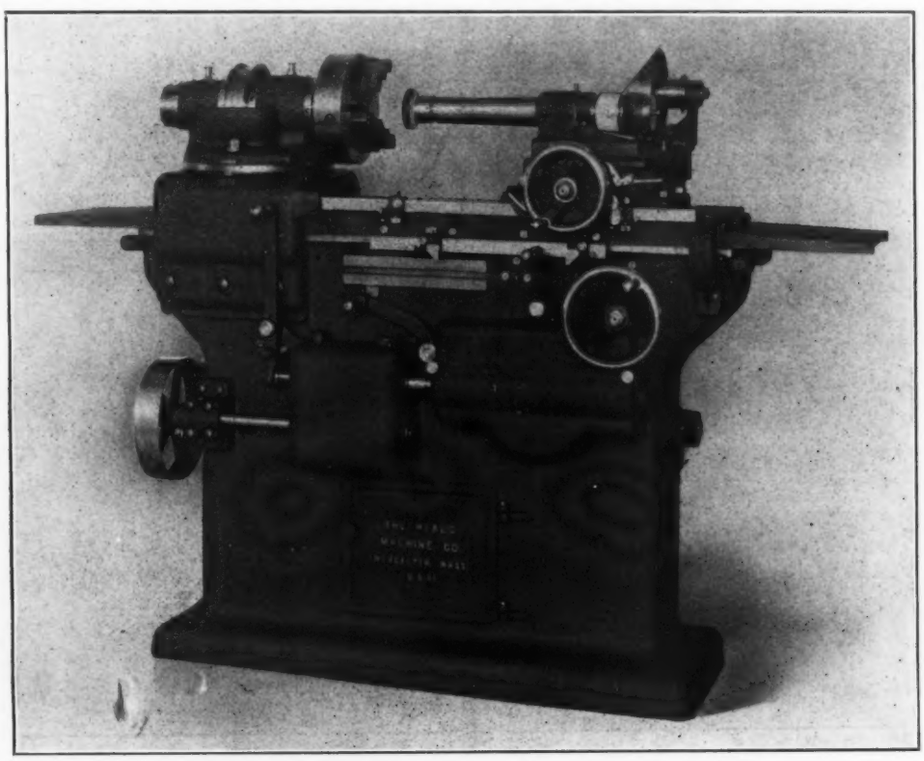


Fig. 1.—Working Side of the New Internal Grinder Built by the Heald Machine Company, Worcester, Mass.

The head spindle is driven by a belt from a five-speed quick change gear box mounted overhead on the countershaft. By this correct working speeds can be obtained, and the operator is enabled to speed up the work with great facility for the finish cut to procure a mirrorlike surface, unobtainable at slower speeds.

The details of the grinding wheel spindle are shown in Fig. 4. The spindle runs in the phosphor bronze bushing *h*, adjustment being obtained through the adjusting nut *j* and adjusting screws *k*. The wheel collet is shown at *l*, the radial ball bearings at *n*, and adjusting nuts at *m*. The spindle is hardened, ground and lapped. The pulley bearings consist of double radial ball bearings, so located

* April 12, 1906.

that there is no belt pull on the spindle. The idler pulley is also fitted with ball bearings, and is adjustable on the cross slide to maintain correct belt tenison. It has two steps, the smaller being driven from the countershaft, and the larger driving the wheel spindle at correct speeds from a moderate countershaft speed.

A special feature is the construction of the wheel head, the outer bearing of the driving pulley being so supported that endless belts can be used, and yet be put on or taken off without any changes or adjustments. This facilitates exchanging the interchangeable wheel heads, which not only permit of easily adapting the machine to work of different sizes at correct cutting speeds, but permit the use of any size wheel head on any one of several machines. Wheel heads are furnished in the following seven sizes:

Size A, smallest hole ⅞ in. diameter and upward by 4 in. long.
Size B, smallest hole 1¼ in. diameter and upward by 3 in. long.
Size C, smallest hole 1¼ in. diameter and upward by 5 in. long.
Size D, smallest hole 2 in. diameter and upward by 4½ in. long.
Size E, smallest hole 2 in. diameter and upward by 7½ in. long.
Size F, smallest hole 3 in. diameter and upward by 6½ in. long.
Size G, smallest hole 3 in. diameter and upward by 11 in. long.

Sizes C, E and G are the same as B, D and F, except as to length, which is made greater to handle extra long holes.

feed is stopped at the predetermined point. A stationary index pointer, *d*, is arranged directly over the center of the index wheel from which all micrometer readings are taken.

Cooling water is circulated by a centrifugal pump mounted on top of an unusually large tank, and the table is provided with channels leading to the water pan, and thence to the tank. The tank contains a large settling chamber for grit, so that only clear water passes to the pump chamber. A novel feature is the mounting of the water tank on truck rolls, so that it can be wheeled to any convenient point for dumping and cleaning out. An exhaust fan is included in the equipment for carrying off the dust produced by dry grinding. Where works are equipped with an exhaust system, or if wet grinding is preferred, this can be omitted.

Another radical departure is the means taken for taking up wear in the various bearings. In each the cap is slightly separated from the lower half of the box, and in the box is fitted a bronze bushing of uniform diameter outside and in, and split at the top. Ordinarily such a bushing is carried in a round hole bored in the box, and when adjusting the cap more closely the tendency is to

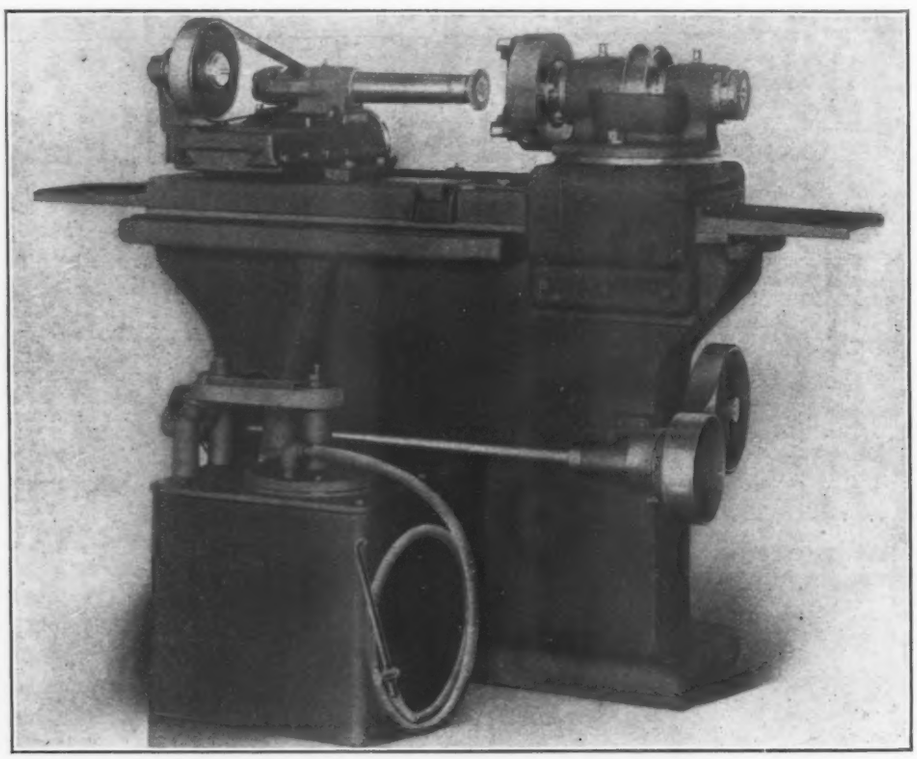


Fig. 2.—Rear View of the New Heald Internal Grinder for General Manufacturing.

The construction of the cross slide is shown in Figs. 5 and 6. The hand feed is through the wheel *a*, or the finger lever *l*, operating the upper of the two pawls shown at *c*, this motion limiting the feed to quarter thousandths of an inch, or one notch of the index.

The power feed mechanism is also shown in Figs. 5 and 6. At the end of the pawl lever *o*, opposite the pawl *p*, is a V-shaped depression, *r*, in which rides the roll *s* on the end of the oscillating lever *u*. Normally, the roll rests at the bottom of the V, but when the table travels to the right or left and comes in contact with the stops *w* on the dog bar *x*, the roll moves from its normal position, and in swinging to either side forces down the end of the lever and elevates the pawl end, causing the wheel to feed, more or less according to the setting of the dog, which can be adjusted to feed from 0.00025 to 0.003 in. at either one or both ends of the stroke, according to whether one or both of the pawls are set to operate. For an automatic knock-off the ratchet wheel is provided with a guard, *y*, covering a portion of the toothed surface of the index wheel *z*, this being set so that when it is brought round to the pawl *p* the latter no longer engages and the

make the hole elliptical with the short axis vertical. To avoid this the boxes of the new grinder are made with a recess at the bottom extending 90 degrees laterally. This construction gives a three-point bearing, with the three points practically equidistant. Consequently the bushing is closed with uniformly distributed pressure, making all diameters of the hole alike and a fit on the shaft.

The length of base of the machine is 52 in., hight of work spindle from floor 45 in., the work spindle bearings are 2¾ and 2¼ in. diameter, and the hole through the work spindle ¾ in. The width of the belt on the grinding spindle is 1¾ in., the head is graduated 45 degrees, and to 4 in. per foot each way. The floor space required is 40 x 92 in. The countershaft is complete, containing a steel drum 12 in. in diameter by 30 in. long for driving the wheel spindle; a five-speed box, with friction clutch and quick acting brake for driving and stopping the chuck spindle, and tight and loose pulleys for the belt from the main line.

W. L. Brubaker & Brothers, manufacturers of taps, dies, reamers and screw plates, Millersburg, Pa., formerly

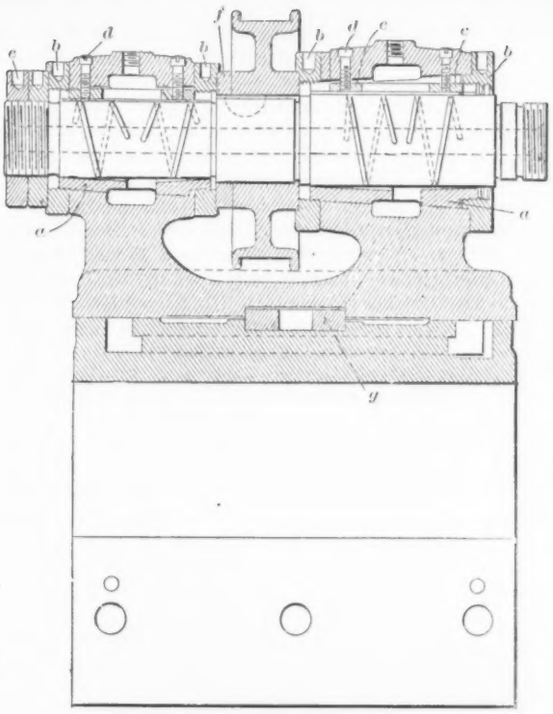


Fig. 3.—Sectional Detail of the Work Head.

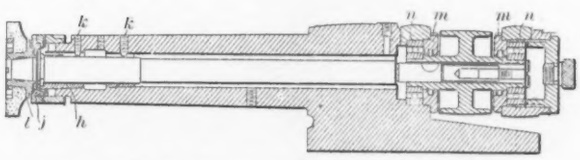


Fig. 4.—Section of the Wheel Spindle.

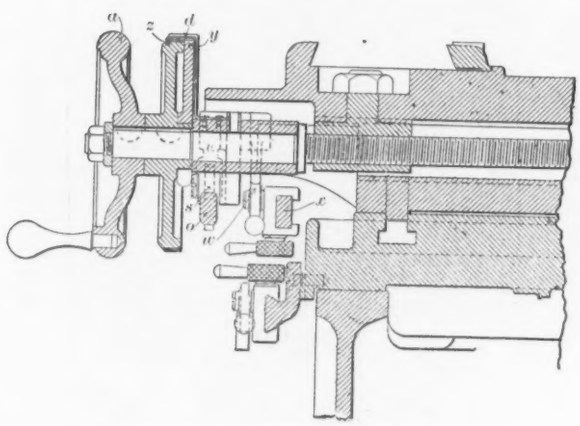


Fig. 5.—Lateral Section of the Spindle Cross Slide.

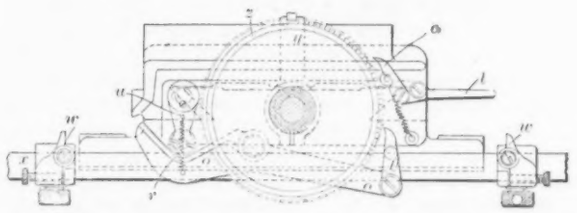


Fig. 6.—Front View of the Cross Slide and Power Feeding Mechanism.

represented in Pittsburgh by the Messenger-Pringle Company, and the Ohio Blower Company, Cleveland, manufacturers of the Swartwout cast iron exhaust head and centrifugal steam separators heretofore represented by the Pittsburgh Steam Specialty Company, have both transferred their agencies to H. W. Hendrickson, 1206 Park Building, Pittsburgh, who will represent them hereafter in that district.

Westinghouse Steam Turbine Census.

The following table shows the aggregate turbine business of the Westinghouse Machine Company at the beginning of the year, classified according to industries. This table shows a summary of 640,700 kw., or 930,000 hp. This output is distributed among 282 plants (averaging 3298 hp. per plant), and 493 machines averaging 1886 hp. per machine.

Summary of Westinghouse Turbines Shipped or on Order up to December 31, 1907.

Classification.	Plant capacity.—Up to 1,000 kw.	Plant capacity.—Above 10,000 kw.	Total number of plants.	Average capacity of turbines, kilow'ts.	Total capacity, kilow'ts.
Electric traction:					
Electric railroads	18,900	144,500	69	1,975	282,600
*(Railroad electrification)	....	33,900	4	3,350	46,900
Totals	18,900	178,400	73	....	329,500
Electric lighting:					
Central stations	23,550	45,000	73	1,440	180,100
Isolated plants	3,200	....	7	400	3,200
Municipal	4,000	....	11	570	8,700
Totals	31,700	45,000	91	....	192,000
Steam railroads:					
R. R. electrification	....	33,900	4	3,350	46,900
*(R. R. car shops)	9,200	....	17	490	15,700
Totals	9,200	33,900	21	....	62,600
Industrial:					
Textile mills	8,200	....	22	595	13,700
R. R. car shops	9,200	....	17	490	15,700
Cement mills	700	....	5	1,012	7,100
Iron and steel works	1,000	....	3	500	5,000
Pulp and paper mills	800	....	5	778	7,000
Rubber works	900	....	4	621	4,350
Powder works	1,200	....	2	400	1,200
Machinery manufacturers	5,400	....	12	576	15,000
General manufacturers	5,750	....	11	453	7,250
Totals	33,150	....	81	....	76,300
Mining and irrigation	8,000	....	19	686	21,950
U. S. Government	1,750	....	4	1,225	12,250
Miscellaneous	6,700	....	14	483	8,700
Grand totals	99,250	223,400	282	....	640,700

* Industries in parentheses, but allowed for in grand totals.

NOTE.—Business uncompleted December 31, 1907: 60 turbines of 153,550 kw., total, leaving shipped or in operation 433 machines, or 487,150 kw., averaging 1122 kw.

In addition to this output listed above there were at that time under construction at East Pittsburgh 148 machines. These bring the grand total of the turbine business of this company up to 864,300 kw., or 1,253,000 hp.

Although there are comparatively few railroad electrification plants yet installed, their capacity is large, 11,670 kw. per plant. In paper and textiles there are 27 plants, aggregating 20,700 kw., or 767 kw. per plant. Nineteen mining properties have adopted turboelectric drive. Thus, while the most fruitful field for the turbine in the early days of its development was in electric traction and electric lighting work its field has greatly broadened out into the general industries, until to-day nearly 15 per cent. of the total represents manufactures, as against 34 per cent. electric lighting and 51 per cent. in traction. An idea of the size to which modern central stations have grown is furnished by the fact that nearly 35 per cent. of the total capacity listed is contained in stations of over 10,000 kw. capacity. A decade ago, at the beginning of the turbine business, stations of this size were few. To-day most large cities have at least one if not several stations of this capacity.

In this connection, some data on the development of the Parsons type turbine for marine work in Europe is of interest. Sir William Matthews, in his recent presidential address before the British Institute of Civil Engineers, cited the following: "In the middle of the present year (1907), there were in service 61 steamships fitted with Parsons turbines, and 65 vessels under construction to be furnished with them. The total horsepower of these ships approached 1,400,000. Of this, about 42 per cent. was in merchant vessels and yachts, and 58 per cent. in war ships. In new ships of the Royal Navy reciprocating engines have given place to turbines."

The Bogoslovsk Mining Estate.*

BY WILLIAM H. SHOCKLEY, TONOPAH, NEV.

The Bogoslovsk Estate lies in the low rolling hills east of the summit of the Ural range, and is geographically in Siberia, though politically in the Perm Government of European Russia. Its irregular area of 3600 square miles extends 144 miles N. S., with an extreme breadth of 53 miles; the town of Bogoslovsk, near the center, being in latitude 60 degrees N., longitudinal 60 degrees E. The estate also owns some outlying areas. While exceeded by the immense private properties of the Czar and by some others (such as that of the Prince of Thurn and Taxis, which is said to comprise 40,000 square miles, of which 17,560 belong to the Domains Company, Ltd., of London), this is one of the largest in the Russian Empire, and ranks with the great estates of the world.

The chief industry of the estate is iron making in charcoal blast furnaces and the manufacture of steel. The product in 1905 was 75,000 tons, nearly all of which was made into steel. Both the iron and the steel are of exceptionally good quality. The latter is made into rails and structural shapes at the Nadesda Works. In 1903 the product was:

	Per ton.
54,000 tons of iron, costing	$8.10
63,000 tons of steel, costing	13.70
44,000 tons of rails, costing	21.08

Extensive alterations and additions, since made to these works, have increased their capacity and reduced the cost of their product. It was estimated that, after completion of the works, the iron would cost $6.85 per ton (a figure which, at the present time, is probably surpassed in cheapness only by the iron furnaces of Shansi, China, where excellent iron is made for $5 per ton), and that the annual product would be 83,000 tons, or one-sixth of the total product of the Urals.

In 1905 the motive power employed at Nadesda amounted to 4555 hp. But a gas engine of 6000 hp., made by the Cockerill Works of Belgium, was then being erected to replace the steam engines, and to be run by the waste gases from the iron blast furnaces. The power in excess of that employed in the iron industry was to be electrically transmitted to the copper mines. The erection of this large gas engine, of most modern type, is a creditable illustration of the enterprise of Russian managers in this region. Other instances could be given. Steam engines were used in the Urals in 1766, and some of the earliest (as the Russians claim, the very earliest) experiments in copper converting were made there. The Bogoslovsk copper converter was set up in 1882.

The charcoal pig iron made on the estate is converted by the open hearth process into steel of excellent quality, which is, for the most part, rolled into rails and structural shapes.

The quantity of the developed iron ores, including those of the Northern iron mine on the Lozva River, has been estimated by Professors Feodoroff and Nikitin at 8,000,000 tons. They are hematites and limonites, containing 30 to 66 per cent. of iron, and occurring in basin deposits, from 13 to 65 ft. thick, 200 to 650 ft. wide and 500 to 1600 ft. long. There is believed to be a great deal of undeveloped ore on the estate and in the Northern iron mine. The output of ore from 1896 to 1903 was 686,000 tons, mined at a cost of from $1.15 per ton in 1896 to 81 cents in 1902.

The deposits are worked by pick and shovel, the ore being hauled from the quarries in 1000-lb. loads by wagons, often driven by women.

Belt Talks.—The first two of a series of six semi-technical booklets on belting have been issued by the J. A. & W. Bird & Co., 34 India street, Boston, Mass. No. 1 deals with belt drive design, covering how a belt drives, ways to increase power, effect of centrifugal force, value of high speed, coefficients of friction and arc of contact. No. 2, dealing with the power of belting, gives a simple rule for power, a rule for belt speeds, describes a computer, referred to later; gives a theoretical rule, and explains the tension due to centrifugal force and the selection of constants. The computer mentioned is copyrighted by the J. A. & W. Bird & Co., and is a celluloid and paper contrivance, which works somewhat on the principle of a slide rule. Directions for its use are printed on the slide, which explains how to compute the horsepower, speed of belt, size of pulleys and size of shafting, and how to correct these results for centrifugal force and arc of contact. In this way it is made theoretically accurate, yet it is simpler than the ordinary computers and quicker to operate. The booklets are sent free on request and the computer for 6 cents in stamps.

* From a paper read before the American Institute of Mining Engineers, New York, February, 1908.

A New W. P. I. Sensitive Drill.

The sensitive drill shown in the illustrations is new, in that the drive is accomplished through a double disk and roll friction and positive cam clutches, doing away with cone pulleys and quarter turn belts. It is a high speed machine, though not an extreme example, and is intended for commercial use with drills up to 9-16 in. in diameter, although heavier work may be done in an emergency, as has been demonstrated by tests. Instantaneous variation of speed is obtained by the movement of a lever handle which changes the relations of the rolls and their disks. The clutches are designed to increase the power automatically as greater duty is imposed at the drill point. The speed of the drill is determined by the passage of the friction rolls across the faces of the disks, with a degree of variation of four to one. The machine is built by the Washburn Shops of the Worcester Polytechnic Institute, Worcester, Mass., in single spindle form as illustrated in Fig. 1, and in multispindle pattern of which Fig. 2 is an example.

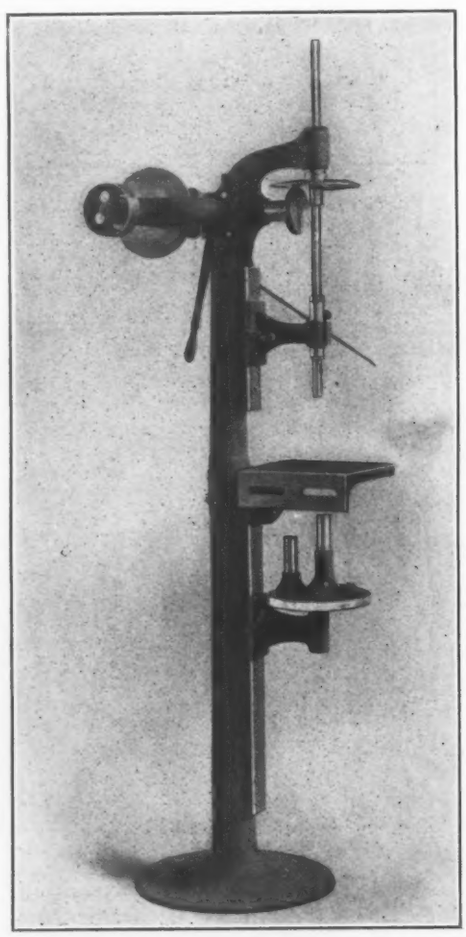


Fig. 1.—The New Friction Driven Sensitive Drill Made by the Washburn Shops of the Worcester Polytechnic Institute.

The transmission of the power from the driving shaft to the spindle through the double friction is shown in detail in Fig. 3. The sleeve *b*, keyed to the driving shaft *a*,

carries as a part of itself one member *c* of the cam clutch. The other half of the clutch, *e*, is a part of the friction disk *d*, which is engaged while operating by the fiber roll *f* mounted on the roll shaft *g*. On the opposite end of this shaft is another fiber roll *h*, engaging the friction disk *j* on the spindle. The two rolls are of equal diameter, as are the two disks. The roll shaft is carried in a self-oiling sleeve in which is cut a rack meshed by a gear segment operated by the handle *l*, which gives the motion of the rolls across the disks, its operation being similar to that of the mechanism for raising and lowering the spindle.

It will be seen that as the roll *f* passes from the smaller to the larger diameter of its disk its speed is increased, while at the same time the roll *h* passes from the larger to the smaller diameter of its disk, which has the effect of multiplying the speed of the drilling shaft in geometric progression. Consequently, with the proportions adopted, the speed of the spindle when the roll *h* is at the smallest diameter of the disk *j*, is four times as great as when it is at the largest diameter. The central portion of the disk *d* is recessed to break contact with its roll and stop the drive to the spindle.

The direct drive of the spindle from its disk is obtained through the cam clutch *k*, which is of the same construction as that on the driving shaft. The part *m* is carried in the bushing running in the bearing of the head and driving the spindle by a sliding key. The lower half of the clutch is a part of the disk *j*. When the drill is started the clutch engages positively, and as greater pressure is applied at the drill point the lower cam surfaces move upon the upper, increasing the normal pressure on the fiber roll, thus automatically increasing the

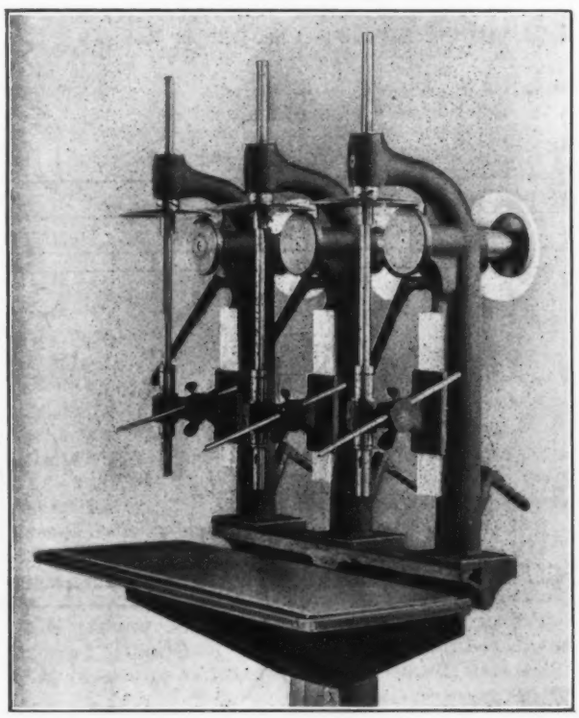


Fig. 2.—A Drill of the Same Type with Three Independent Spindle Heads.

driving power as the demand for it increases with the work. The cam is backed by a ball bearing, and a slight spring serves to keep the cam surfaces together, so that the disk may always be in contact with the roll. The recommended speed of the driving shaft is 800 rev. per min., which gives a variation in speed to the drill of from 400 to 1600 rev. This speed has been chosen on the theory that best efficiency is obtained with surface speeds of about 70 ft. per minute for high speed drills. Higher or lower cutting speeds can easily be obtained, if desired, by changing the speed of the driving shaft. The spindle has a No. 1 Morse taper socket, which takes drills up to 9-16 in. diameter, which seems to be the generally accepted limit of sensitive drill work.

The disks are of cast iron and the rolls of fiber, held between iron plates. The spindle has a travel of 3 in. and the head a vertical adjustment of 7½ in. The diameter of the spindle in the sleeve is ⅞ in.

In the multiple spindle type each head is a unit in itself. The heads may be slid along the column to as

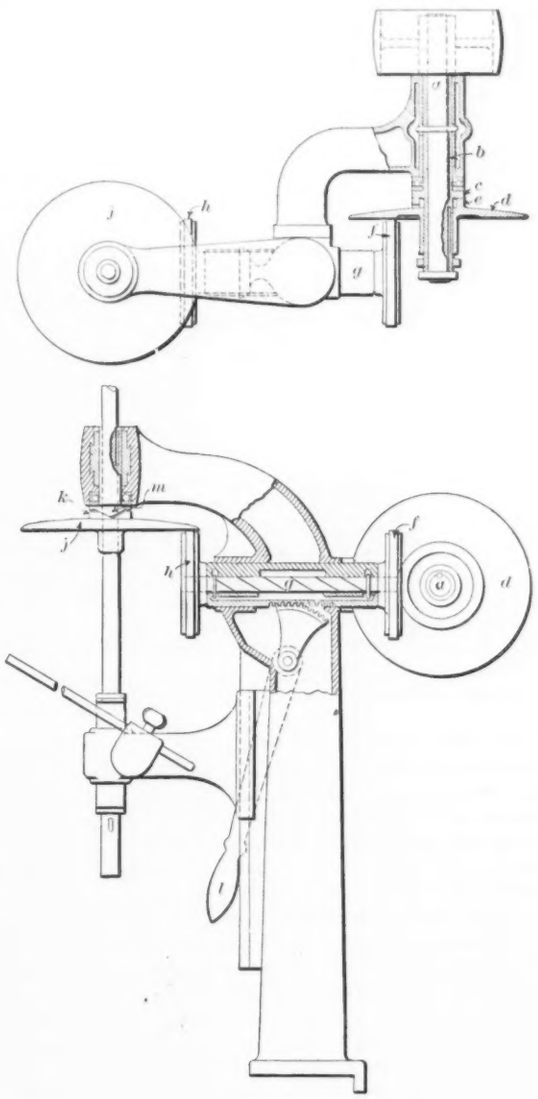


Fig. 3.—Details of the Friction Driving Mechanism of the W. P. I. Drill.

close as 10 in. centers. Any head may be taken from the column or extra heads added as the work requires. The head is fastened to the column by a T-bolt set at an angle, and is drawn into position by the lever nut shown at the rear of the machine. The single spindle machine weighs about 250 lb., the two-spindle 450, and the three-spindle 650 lb.

The Fore River Shipbuilding Company, Quincy, Mass., is building four steam turbines of 12,000 hp. each for the Japanese Government. Two of them will go into a cruiser now building, and are designed to give a speed of 23 knots. The other two will be installed in a first-class battleship, which will have a speed of 21 knots under the contract. They are 144 in. in diameter and will weigh 450 tons boxed. The two sets of turbines will cost about $750,000.

The recent purchase of the plant of the Morgan Spring Company at Struthers, Ohio, by the Youngstown Sheet & Tube Company, has led to the publication of reports that the latter concern is negotiating for the purchase of practically every plant in the Mahoning Valley. We are officially advised that the company is not considering in any way the purchase of more plants at the present time.

Hand Bending Tests of Materials.

Tensile tests alone are inadequate to indicate the true value of material in actual working practice; when a material will have to sustain moving stresses, it is evident that to test it merely by static loads is insufficient and a dynamic test is required. The most favored and promising method of testing in this way is by bending a piece in opposite directions, counting the number of alternations necessary to fracture it. In Professor Arnold's machine the metal is alternately strained beyond the elastic limit in each direction.

Capt. H. Riall Sankey, who in conjunction with J. Kent Smith has done such good pioneer work on vanadium steels, has devised a workshop testing machine, which was described in *Engineering* (London) some months ago. By means of this instrument, in which a test piece is bent alternately backward and forward through a given angle, results are obtained very similar to those given by Arnold's machine.

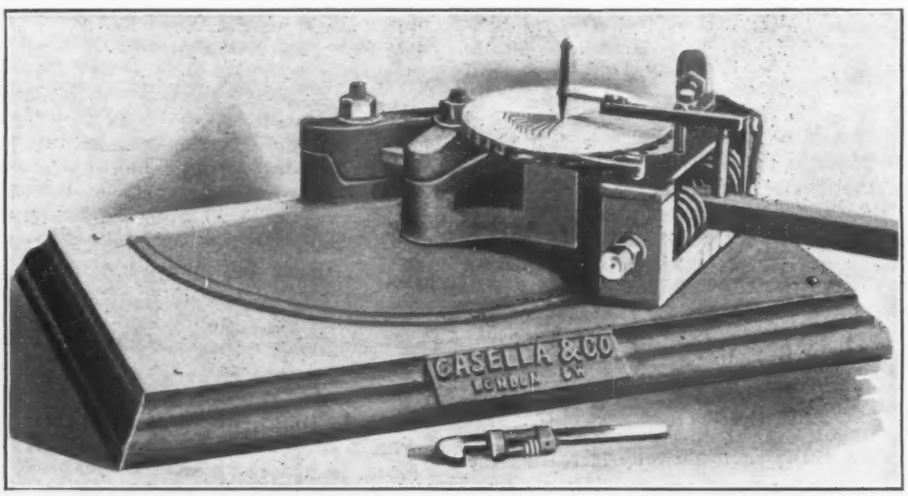


Fig. 1.—A Small Hand Machine for Making Bending Tests of Materials, Invented by Capt. H. Riall Sankey.

Description of the Instrument.

The machine is illustrated in Figs. 1 and 2. Its general character may be best understood by a reference to Fig. 2. It consists essentially of a bedplate to which is secured the small vise *a*. One end of the test piece is secured in this vise, while the other end is fastened in a similar vise, *b*, mounted on the end of a movable frame. The specimens used are ⅜ in. square and 4 in. long. A gauge is used in placing them in position, so that the piece being bent is the same length in all cases. The specimen is then bent through a definite angle by means of the handle *e*, first in one direction and then in the other, until it breaks. In Fig. 2, it may be seen that the movable frame swings about *d*, and that the pressure exerted is transmitted through the springs *f*. The compression of these springs measures the load applied to the specimen, and as the springs compress the handle *e* swings around the pivot *d*. The displacement of the handle is utilized for the drawing of an autographic diagram, which shows the maximum force applied on each alternate bend of the specimen, and also the total number of bends before failure occurs.

Sample diagrams are shown in Fig. 3. The cards, circular in form, fit down upon the ratchet wheel *k*, with which they are concentric. A pencil seen in Fig. 1 and indicated at *g*, Fig. 2, traces a circular arc on the card when the lever is pushed over. On the return bend the ratchet wheel is pushed over one tooth, so the pencil traces another arc. Each arc on the diagram represents a bend in each direction, so that the total number of bends is equal to twice the number of arcs on the card. The concentric circles shown on the diagram represent equal increments of load on the specimen. It may be seen that much more effort was required when the right hand diagram, Fig. 3, was taken, than with the left hand one. The cards form a permanent record of both the stiffness of the material and the number of bends required to fracture it.

Some Results Obtained.

Tests have been made upon a series of carbon steels and upon three samples of steels containing 0.04, 0.3 and 0.5 per cent. phosphorus respectively. In the case of the phosphorus steels, tensile and Wöhler tests gave unsatisfactory results, whereas impact and Arnold tests showed the injurious effect of the phosphorus. In making hand bending tests it was noticed that in many cases the final rupture gave some warning by small cracks appearing, but in others there was no previous indication and the steels broke with a snap and a loud noise. Both of the high phosphorus steels snapped. The results are given in the following table:

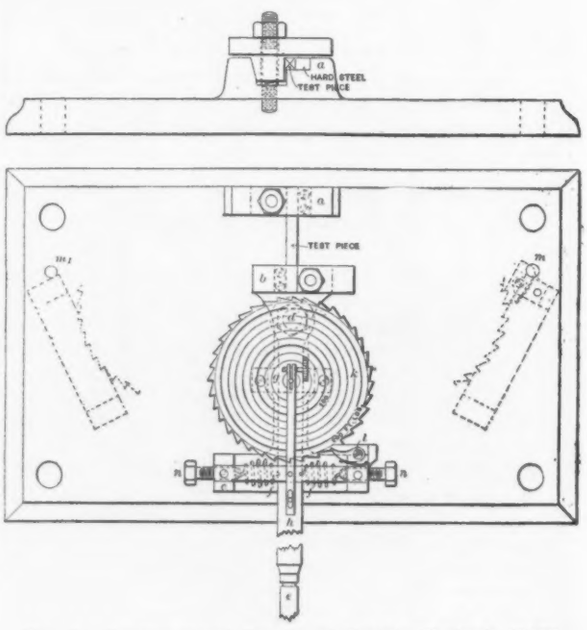


Fig. 2.—Constructional Details of Captain Sankey's Hand Bending Tester.

Mark.	Number of bends.	Average bending effort foot-pounds.	Energy absorbed to fracture.	Fracture.
0.04-P	18.0	110	3,960	Silky.
0.30-P	11.3	128	2,900	Granular and silky.
0.50-P	5.3	157	1,660	Fine crystalline.

The series of carbon steels were very pure crucible steels, with the carbon running from 0.13 to 1.306. The full analyses, and many tests upon them, are given in the Sixth Alloys Report of the Institution of Mechanical Engineers. A comparison of the hand bending with the ordinary tests shows that numerical figures are obtained by means of which the quality of the steel can be compared in the same manner as by the ordinary tensile test

and the impact test combined. They are given in the following table, the tests being on forged unannealed steels:

Number.	Carbon.	Number of bends.	Average bending effort, foot-pounds.	Energy absorbed.
1	0.13	43.5	61	5,300
2	0.18	30.5	83	5,060
3	0.25	21.2	72	3,050
4	0.47	23.5	92	4,320
5	0.72	12.2	130	3,170
6	0.87	5.1	170	1,730
7	0.95	4.3	157	1,300
8	1.31	3.2	124	800

The bending machine also produces a fracture which varies very considerably with the quality of the steel, a variation greater than with an impact test, and much

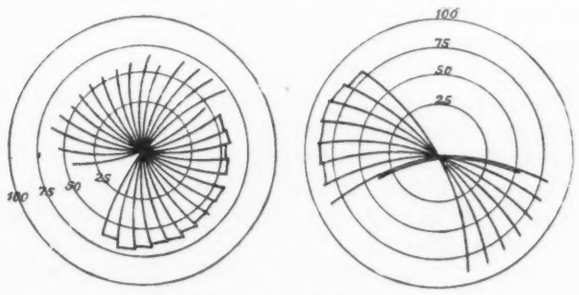


Fig. 3.—Specimen Diagrams from One of the Testers.

greater than in the case of a tensile test. This is illustrated in the following table:

No.	Carbon.	Fracture impact test.	Fracture bend test.
1	0.13		Silky.
1	0.18	Very fine granular.	Silky.
3	0.25	Very fine granular.	Granular and silky.
4	0.47	50 % very fine crystalline.	Fine granular.
5	0.72	Fine crystalline.	Granular and crystalline.
6	0.87	Very fine granular.	Medium crystalline.
7	0.95	Very fine granular.	Fine crystalline.
8	1.31	Crystalline.	Fine crystalline.

Captain Sankey's simply constructed, readily operated machine seems to have demonstrated its efficiency and to be worthy of adoption on an extended scale for practical use.

The Des Moines Bridge & Iron Company's Pittsburgh Plant.

The Des Moines Bridge & Iron Company, Des Moines, Iowa, some time ago purchased 10 acres of land on Neville Island, near Pittsburgh, on which it is now completing a plant to supply the Eastern and part of the Western trade. This plant comprises a number of buildings, as follows: The fabricating shop is of steel construction, with sheet sidings, 120 x 150 ft., and contains four Cleveland combination punches and shears, one 8-ft. bending roll, six 2-ton chain cranes, one 48-in. plate shear, one dishing machine of special design, one rotary planer and a bulldozer. The blacksmith shop, now being completed, is also of steel construction, 50 x 100 ft., and will contain forges, lathes, bolt cutters, &c. A machine shop, 50 x 100 ft., will be built later. An Ingersoll-Rand compressor located in a shed furnishes air for operating the tools. The machine tools will have individual motor drive, the power being furnished by the Brunots Island plant of the Allegheny County Light Company.

The stockyard is served by three 350-ft. crane runways. It is connected by spur track from the Pittsburgh & Lake Erie Railroad to the main building, and also has a system of narrow gauge tracks for hauling plates and structural material. In this yard are a friction cold saw, a Cleveland combination punch and shear and a riveting machine, located close to the stock.

This plant will be known as the Pittsburgh branch and will be devoted to the manufacture of steel tanks, bridges and general structural work. It will have an ultimate capacity of 500 to 1000 tons per month. H. L. Eastman is the Pittsburgh manager, having his office at the plant. This branch is now turning out an order for 2000 tons of structural work for a new post office at Los Angeles, Cal., and four large water towers of the hemispherical bottom type and steel work to support them, for shipment to different points. It also has orders on its books for much other work.

Customs Decisions.

Cold Rolled Steel in Strips.

After a litigation extending over the tariffs of 1894 and 1897, the Joseph F. McCoy Company and others at New York have won a victory in the contention for reduced duty on certain cold rolled steel in strips. The merchandise, which was imported at various times, was assessed for duty as "sheet steel in strips," whereas the importers claimed the articles to be dutiable properly as "steel in all forms and shapes," at the specific rates provided for this class of goods under the Wilson and Dingley laws. The strips are of very thin steel, in lengths of about 50 ft. or over, and in width varying from 1 to 12 in. After reviewing the issue at some length, General Appraiser Fischer, in his decision for the board, reaches the conclusion that the claims of the importers are well taken. The protest is accordingly sustained.

Knife Sharpeners Made of Emery.

In sustaining a claim filed by George Borgfeldt & Co., New York, the Board of United States General Appraisers has decided that knife sharpeners made of emery composition with wooden handles are free of duty under the provision in the tariff act for "whetstones." The question for the board to settle was whether the sharpeners should pay duty according to the component material of chief value, which in this case is stated to be wood. After a consideration of the testimony, however, the tribunal, in a decision written by General Appraiser McClelland, reaches the conclusion that the articles should be allowed to enter as "whetstones."

Actual Examination of Goods by General Appraisers Not Required.

That there is nothing in the Federal statutes requiring the actual examination of imported merchandise by a board of three general appraisers in a reappraisement proceeding is the burden of a decision just promulgated by the Board of United States General Appraisers. The decision of the tribunal was called forth by a protest filed by Loeb & Schoenfeld, New York, who through the law firm of Curie, Smith & Maxwell, sought to upset reappraisements made nine years ago during the administration of Wilbur F. Wakeman as Appraiser of the Port. The attempt, however, so far as the board is concerned, ends in defeat for the protestants. Eugene G. Hay, who writes the decision for subboard No. 3, further lays down the proposition that in the case at bar, the examination of the goods, which happened to be Swiss embroideries, would not have in any way aided in arriving at a right conclusion. "Hence," says the decision, "the reappraisement in question is not invalid by reason of the failure of the board to have before it the exact merchandise in question or samples thereof. The protest is therefore overruled."

A Railroad Shop Uses a Suction Producer and Gas Engine.—The main car repair shop of the Minneapolis & St. Louis Railroad at Minneapolis is one of the first railroad shops to introduce the suction producer and gas engine. Proximity to a desirable residence section made it necessary to suppress smoke. The *Railway Age* says of the results: "The elimination of smoke has been effected, and it is reported that in operation the plant shows a low cost for fuel. The coal used is anthracite pea, and the consumption, when the engines are carrying 75 to 80 per cent. of normal rate, is only 1 lb. per brake horsepower, and the total cost of fuel, attendance and operation is given as $1.24 per horsepower per month. There is one engine of 140 hp. for the mill and two engines of 80 hp. for driving electric generators. The first cost of large gas engine plants is virtually on a par with first-class reciprocating engine plants, about $100 per horsepower, while the costs for fuel, for labor, handling of coal and ashes, and for maintenance, are each reported to be about one-half as much per unit as the corresponding items for a plant using steam engines and boilers."

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The "Academic Rights" of Labor Unions.

The comments of labor journals, the published utterances of labor leaders and "Labor's Protest to Congress"—all dealing with recent court decisions unfavorable to labor unions—indicate how thoroughly ingrained in unionism is the idea that the application of the law of the land must be bent to the wishes of organized labor. There is irony in that protest, which, in attacking the Supreme Court for holding that some acts of labor unions fall under the prohibition of the Sherman Anti-Trust law, views with alarm the "endangering of individual liberty." This from organizations that make no apology for using any means to prevent a nonmember from working when the union says no work can be done! And a trade union journal, apparently laboring under the belief that an effort is being made "to drive them [the unions] out of existence by legislation and court decrees," serves notice that "the unions of labor will live; they cannot be, they must not be, will not be driven out of existence"; and, finally, that "labor demands relief at the hands of Congress, and demands it *now*." Along with these various stormy protests and demands there is this sarcastic reference to the "rights" now guaranteed to labor by the courts:

> The right to be maimed and killed without liability to the employer.
> The right to be discharged for belonging to a union.
> The right to work as many hours as employers please and under any conditions they may impose.

It is hardly necessary to say to those who have followed the labor legislation and court decisions of recent years, and particularly the attitude of municipal authorities and some State Executives toward lawbreaking strikers, that the catalogue of union labor "rights" has not been diminishing but rather expanding. Just now excited utterances are evoked by court decisions indicating that there are constitutional bounds which legislation forced by the so-called labor vote cannot cross. This outcry reminds one of the reason given by the New Zealand labor unions for refusing to accept the results of certain arbitration under that country's well advertised system: "Why, they've decided against us!" The loose rein under which unionism has been running receives a check, and the air is suddenly full of tumult, because "the association of human beings for education and progress" has been interfered with.

If the declared purposes of trade unions—those purposes so well set forth in magazine articles and so uniformly urged by ministers, professors and the sociology specialists who occasionally get seats in legislative bodies—were their only purposes, there would be no trouble from adverse court decisions. But the benevolent programme of aspiration, uplift, betterment and all the rest somehow gets diverted and in its place we sometimes get mobs, riots, murders, maiming, boycotts, incendiarism and dynamiting. It is not what trade unions do to help their members that the courts have found fault with, but what they do to injure nonmembers and to hurt the business and destroy the property of employers. And when courts attempt to define the rights of unions and to point out what things they may lawfully do, naming the very things the labor leaders specify when writing for the public prints, there promptly comes back the derision of "Labor's Protest to Congress," and we are told that "labor is justly indignant at the bestowal or guaranteeing of these worthless and academic 'rights' by the courts."

The trouble has long been that the labor unions have paid too little attention to their announced programme of improving the condition of their members and vastly too much to their campaign of coercing workmen into their ranks and coercing employers to grant their demands, whether reasonable or not. If the unions agitated for skill and efficiency and high grade workmanship with half the energy they put into inflicting injury their influence would be greater, as would also their ability to secure better conditions for their members. In very large part the present agitation for the improvement of mechanical ability and for increasing the number of skilled workmen in all manual trades is carried on by employers, either as individuals or as members of employers' associations, while militant unionism spends large sums in carrying on strikes and in battling for the "right" to boycott and coerce. We are not pessimistic enough to believe that unions of the Gompers type will always be as representative of the trade union movement as they seem to be to-day. Some of the strong unions of the country have maintained a different standard and have operated on a higher plane. They have spent less time in contending for the "right" to lay violent hands on the persons and business of others, but they have made more progress toward the legitimate objects of unionism, which leaders of the violent type are now pleased to deride as "academic and worthless."

The Buying of Heavy Milling Machines.

The scope of the milling machine has been broadly increased in recent years. It has been applied to work formerly considered entirely outside of its field, and its builders believe that the extent of its usefulness is even now but dimly realized in the machine shops. The successful manufacture of high speed cutters caused its greatest advance, and at the same time compelled its redesigning on lines giving greater weight and power. In this connection there is interest in the statement of a writer in the London *Engineer* that the tendency, presumably in England, is to buy milling machines by weight rather than by general excellence of design. We do not believe that this is the case in the United States. Yet it is conceivable that with the realization of the greater rigidity and general strength required with the use of high speed steels buyers may have been influenced in the beginning of the new machine tool epoch by weight, regardless, perhaps, of the fact, as the writer asserts, that cast iron is cheap, and its bulk is not always a part of correct design for high duty machinery. The buyer should take into account correct design only, which includes sufficient, properly distributed weight and sufficient power. The English critic lays down these maxims:

The purpose of a heavy milling machine is to remove metal.

The metal is removed by utilizing the power which is provided.

If a large amount of power is not provided, a large amount of metal cannot be removed, no matter how well built the machine may be.

If the power is provided and the equivalent amount of metal cannot be cut away, the machine must be badly designed or badly made.

If a milling machine is well designed and well made and has a large amount of power, the work that can be done will bear an approximate relation to the power provided.

Tests are cited, made with 10 milling machines of different makes to determine the ratio of power to weight. The machines ranged in weight from 3820 to 4620 lb. The heaviest machine had only 2.4 hp., the lowest of them all. The lightest machine had 3.6 hp. The most efficient of all was a machine weighing 4000 lb., which developed 7.94 hp. "It might, perhaps, be urged," says the writer, "that the horsepower of such a machine [referring to one of low power] may be increased by speeding it up; and while this is true, it is, of course, also true that the low spindle speeds have to be sacrificed, and as they are often needed for the heaviest work, the gain in the power supplied to the machine is discounted by the loss of the low spindle speeds. Moreover, machines which are designed to run at a low speed are very liable to be noisy and to suffer under undue wear when speeded up. This is a fact which was very forcibly brought home to machine users by their earlier experiments in speeding up old lathes to use high speed steels."

Then follows a pretty good summary of the success which the American builders of milling machines have achieved in designing tools for use in high duty work: "The working parts of a machine which is to utilize high power and to remain in good condition must be stronger and of better material than is the case with low powered machinery. The bearings and wearing surfaces must be better, and the lubricating more efficient; high tensile steels must be used for shafts and spindles, and steel gearing must be liberally employed; the workmanship also must be of the best class, and, therefore, if high power is to be fairly provided for when buying, it cannot be expected that machines of the necessary high class character can be obtained at the same price per ton as low priced powered machine tools of the same or even greater weight."

The British builders of machine tools have always gone in for weight. There is a solidity of design and construction which looks powerful, and one can readily see how the prejudice referred to can exist over there. The difference in weight, power for power, between American and English machinery has grown less in high duty tools under modern demands, due to the advent of the new steels. But our own machine tool builders and designers have always had the faculty of distributing the metal in a machine tool as it should be. Weight is usually sufficient for the purposes of the machine, but the effort has always been made not to saddle the tool with unnecessary iron. In the extraordinarily rapid advance in milling machine design during the past few years, weight has been added with prodigal hand, where high speed cutters were to be employed. The very latest machines, some of which the public knows little of as yet, have probably reached the limit of the new steels, following in the footsteps of other types of standard machinery. But with such American machines the customer need have no fear in buying by weight. The metal is needed; there is none too much, though massiveness is the only word that will adequately describe their lines. Chips of brutal size indicate the work they impose upon their cutters; chips of steel, blued with the heat of friction, just as the modern lathe or planer rips off metal in the process of removing stock. The horsepower required is astonishingly great. American milling machine builders may feel a pardonable pride in the fact that no criticism of imperfect ratios of weight and strength and design and power can be fairly applied to their latest mechanical creations.

The Industrial College Problem.

The engineering schools, especially in their departments of mechanical and electrical engineering, receive frequent inquiries concerning entrance examinations from young men who have the means in sight to carry them through the course, but are without the necessary preliminary training. A large percentage of these men are mechanics who have saved their money and are ambitious to equip themselves for higher places, realizing that the training of a polytechnic institute bridges a very great gap in the mechanic arts. They would be well served by an industrial college, such as the Industrial Commission of Massachusetts has recommended for that State and for which a bill is now before the Legislature. The plan includes extensive buildings, the most modern of shop, laboratory and other equipment, and a corps of instructors sufficient in number to train a large student body. The idea as it is generally understood is to place the institution between the engineering school and local technical or trade schools. The students would not graduate as engineers, but would be equipped to become superintendents and high class foremen. This is a kind of timber it is more difficult to secure every year, especially where the manufactured product he is to deal with requires the supervision of a man with more engineering knowledge than is ordinarily obtainable in working up through successive steps in the shop itself.

Strong advocates of the plan have appeared at the hearings on the recommendations of the Massachusetts commission, but the opposition has been equally aggressive. It is argued that many of the cities and larger towns of the State are not yet provided with local industrial schools, which are essential to the manufacturing life of the community, and it is maintained that the State would do better service to its people by using the money asked for the college in the establishment or assistance of such schools. Another argument is that, were the college established, the tendency would always be to raise its standard until it would be on a par with the engineering schools of the State, such as the Massachusetts Institute of Technology, Worcester Polytechnic and the engineering school of Tufts College.

In considering the matter of State aid to local industrial schools the smaller towns are lost sight of. There are those who maintain that each community should support its own school, just as it does its high school. Many of the States have plenty of small towns and villages built around important industries which are not large enough or rich enough to maintain industrial schools for their young men, even with the assistance of the State. To be sure, the ambitious can move to larger places where, if they are employed during the day, they can attend the evening classes which constitute an essential feature of the modern school. But at best this entails the drawing away of ambitious men from manufacturing centers where their services are needed. The desire to get ahead and dissatisfaction with the prospect of going through life without the advantages of education are potent influences on the better class of American youth of humble means. If they can see a way to get an education they will save the money even at much sacrifice in order to carry out their purpose.

Some are able to enter the engineering schools, where their success is often notable. But by far the larger number have not the basic education to enable them to enter these higher institutions, or, if they do, to endure successfully the ordeals of advanced work in subjects in which they are insufficiently well grounded. They realize this after inquiry or experience and their ambition goes for naught, because there is no other opening for them. If an institution in their State would take them without an onerous examination, and if its course were not dependent upon advanced earlier training in the textbooks, the way would be clear to them. A considerable percentage of them would return to their own towns to take responsible positions with home manufacturers who know them. Doubtless employers would assist some worthy employees in obtaining such education; parents and friends would help others. Still another class of young men would profit by the college—those whose engineering instincts are strong, but who have not the mental power to master other branches of study that are necessary to round out the course of the engineering school.

In some way better provision will have to be made by the State or private philanthropy for the education of competent men who will carry on the work lying between that of the engineer and office, on the one hand, and the working forces, on the other. The beginning has already been made on a limited scale, in the establishment of the right sort of industrial schools, which are above ordinary trade schools or manual training schools. The apprentice system is reviving, but the number of graduates is very small compared with the need of the future resulting from the wonderful growth of the country. It is doubtful if the apprentice system and the common type of industrial school can go far enough in their preparations of young men for positions of responsibility, though they establish a basis from which men may be developed. The training of boys of school age must of necessity be far less effective than that of young men of college age or beyond it, especially if the latter have had the preliminary practical experience of employment in a shop, combined with the ambition which has led them to drop their work and seek a more advanced education. Many of them would be graduate apprentices. The drafting room would also furnish its quota.

Judged as an investment the college should bring a high percentage of return to a State. Good men are wealth producers. The average mechanic who has the training of such an institution would have a much greater earning power for the community than if he had been compelled to live out his life as it was begun in the shop. The idea of an industrial college supported by public funds may be premature, but its need is none the less apparent, a fact that will be realized more and more, as the scarcity of thoroughly efficient men for intermediate positions of responsibility is felt more acutely.

Steel and Malleable Castings.

The large field occupied in the United States by steel castings and malleable cast iron is emphasized anew in the production statistics of the former for 1907, and in the recent paper of William H. Hatfield on malleable castings, of which a considerable portion is given on other pages of this issue. With a capacity to produce more than 1,000,000 tons of malleable castings a year, and with an output that in 1907 probably reached 800,000 to 850,000 tons, and nearly as much in 1906, the United States has utilized this form of cast iron to the extent of more than 10 times the totals for all other countries combined. The paper referred to above calls special attention to the slowness with which Great Britain and other European countries have developed the use of this serviceable product, and by reproducing the results of tests points out that in ductility and in resistance to strain malleable castings have been made, that much better fill the place of steel than has been commonly accepted. In ductility the special castings referred to in the paper are certainly noteworthy, though the tests cited do not do justice to American malleable castings in the matter of strength.

The steel castings production of the United States is not so greatly in excess of that for the rest of the world as is that of malleable castings. Great Britain collects no separate statistics of steel castings. Germany in 1906 produced 189,000 tons. With 745,877 tons of open hearth castings and about 33,000 tons of Bessemer castings, the United States probably produced of crucible and other kinds sufficient to bring the total above 800,000 tons last year, so that the combined production of steel and malleable castings was between 1,600,000 and 1,700,000 tons. The combined railroad consumption was well beyond the 1,000,000 ton mark. What is of special interest to steel founders is the further advance of basic open hearth steel castings, bringing them almost to a parity with acid open hearth castings. The geographical distribution of the two processes is shown as follows in gross tons for the past two years:

	Basic castings.	Acid castings.	Basic castings.	Acid castings.
	1907.		1906.	
New England, New York and New Jersey	56,109	44,100	38,533	50,977
Pennsylvania	59,529	248,755	31,914	273,148
Ohio, Indiana, Illinois and other States	250,838	86,546	243,101	82,218
Totals	366,476	379,401	313,548	406,343

From being 77 per cent. in 1906, basic open hearth castings were more than 96 per cent. of the acid open hearth total in 1907. In Pennsylvania and the Eastern and New England States basic castings increased, while acid castings declined, and in the Middle West and the Southwest, the St. Louis District being an important factor, both acid and basic open hearth castings increased slightly. The total of 800,000 tons of steel castings in 1907, compares with 773,705 tons in 1906, 560,767 tons in 1905 and 330,000 tons in 1904. So recently as 1900 the production of steel castings was but 192,803 tons, or less than 25 per cent. of last year's record.

In a pamphlet of 45 pages, entitled "Tie Plates," the Hart Steel Company presents illustrations and details of the product of the Elyria Iron & Steel Company, Elyria, Ohio, for which the former company is the selling organization. A special feature is a collection of diagrams showing the punching data for a number of rail bases used by railroads, for which the company has furnished tie plates. The full dimensions are given for intermediate and joint plates, and elevations as well as plans are shown indicating the style of tie plate, number of holes and method of applying right and left hand plates. Twenty-five pages are given up to these drawings and other details. Half-tone views are shown of the various styles of rolled steel plates of the McKee type, and the result of this reinforcement is presented in a report of tests conducted by Robert W. Hunt & Co. The general sales office for the company's tie plates and spikes is at Elyria, Ohio, and the Hart Steel Company also has offices at New York, Chicago, Atlanta and San Francisco.

The Federal Railroad Tunnel through the Ricken Mountains, near Lake Zurich, Switzerland, was completed March 30. Construction on this tunnel, which is nearly 5 miles long, was begun four years ago.

Alcohol and Gasoline Compared.

Tests Made by the U. S. Geological Survey.

The Technologic Branch of the United States Geological Survey, under the direction of J. A. Holmes, has recently completed an elaborate series of tests on the relative value of gasoline and alcohol as producers of power. The tests, over 2000 in number, probably represent the most complete and exact investigation of the kind that has been made either in this country or abroad, and includes much original research work. Prof. R. H. Fernald, engineer in charge of the gas producer section, and professor of mechanical engineering in the Case School of Applied Science, Cleveland, Ohio, was in general charge of the tests. R. M. Strong, formerly connected with the engineering department of Columbia University, had personal supervision of the work. He was assisted by a corps of specially trained men. These tests were conducted at the fuel testing plant of the Geological Survey, at Norfolk, Va., and show the following results in regard to the comparative fuel consumption of 73 degrees specific gravity gasoline and commercial completely denatured alcohol, per unit of power.

Equal Volumes Consumed Under Like Conditions.

Correspondingly well designed alcohol and gasoline engines, when running under the most advantageous conditions for each, will consume equal volumes of the fuel for which they are designed. This statement is based on the results of many tests made under the most favorable practical conditions that could be obtained for the size and type of engines and fuel used. An average of the minimum fuel consumption values thus obtained gives a like figure of eight-tenths of a pint per hour per brake horse power for gasoline and alcohol.

Considering that the heat value of a gallon of the denatured alcohol is only a little over six-tenths that of a gallon of the gasoline, this result of equal fuel consumption by volume for gasoline and alcohol engines probably represents the best comparative value that can be obtained for alcohol at the present time, as is also indicated by Continental practice. Though the possibility of obtaining this condition in practice here has been thoroughly demonstrated at the Government fuel-testing plant, it yet remains with the engine manufacturers to make the "equal fuel consumption by volume" a commercial basis of comparison.

Conditions Under Which the Tests Were Made.

The gasoline engines that were used in these tests are representative of the standard American stationary engine types, rating at 10 to 15 hp., at speeds of from 250 to 300 rev. per min., while the alcohol engines were of similar construction and identical in size with the gasoline engines.

The air was not preheated for the tests on alcohol and gasoline, and the engines were equipped with the ordinary types of constant level suction lift and constant level pressure spray carburetters. Many special tests with air preheated to various temperatures up to 250 degrees Fahrenheit and tests with special carburetters were made, but no beneficial effects traceable to better carburation were found when the engines were handled under the special test conditions, including constant speed and best load.

The commercial completely denatured alcohol referred to is 100 parts ethyl alcohol plus 10 parts methyl alcohol plus one-half of 1 part benzol, and corresponds very closely at 94 per cent. by volume, or 91 per cent. by weight ethyl alcohol (grain alcohol). No detrimental effects on the cylinder walls and valves of the engines were found from the use of the above denatured alcohol.

The lowest consumption values were obtained with the highest compression that it was found practical to use, which compression for the denatured alcohol ranged from 150 to 180 lb. per square inch above atmosphere.

Price Conditions Necessary for Competition.

Eighty per cent. alcohol (alcohol and water) for use in engines of the present types would have to sell for at least 15 per cent. less per gallon than the denatured alcohol in order to compete with it. The minimum consumption value in gallon per hour per brake horsepower for 80 per cent. alcohol is approximately 17.5 per cent. greater than for the denatured alcohol used or for gasoline. A series of tests made with alcohol of various percentages by volume, ranging from 94 to 50 per cent., showed that the minimum consumption values in gallons per hour per brake horsepower increased a little more rapidly than the alcohol decreased in percentage of pure alcohol—that is, the thermal efficiency decreased with the decrease in percentage of pure alcohol. This decrease in thermal efficiency or increase in consumption referred to pure alcohol is, however, comparatively slight from 100 per cent. alcohol down to about 80 per cent. alcohol. Within these limits it may be neglected in making the calculations necessary to compare the minimum consumption values for tests with different percentages of alcohol.

The nearer the alcohol is to pure, the greater the maximum horsepower of the engine. The reduction in maximum horsepower for 80 per cent. alcohol, as compared with that for denatured alcohol used, was less than 1 per cent., but the starting and regulating difficulties are appreciably increased.

With suitable compression, mixtures of gasoline and alcohol vapors (double carburetters) gave thermal efficiencies ranging between that for gasoline (maximum 22.2 per cent.) and that for alcohol (maximum 34.6 per cent.), but in no case were they higher than that for alcohol. These thermal efficiencies are calculated from the brake horsepower and the low calorific value of the fuel, which for the gasoline was 19,100 B.t.u. per pound, and for the denatured alcohol was 10,500 B.t.u. per pound.

Use of Alcohol in Gasoline Engines.

As has been previously published, alcohol can be used with more or less satisfaction in stationary and marine gasoline engines, and these gasoline engines will use from one and one-half to twice as much alcohol as gasoline when operating under the same conditions. The possibilities, however, of altering the ordinary gasoline engine as required to obtain the best economies with alcohol are very limited, for the amount that the compression can be raised without entirely redesigning the cylinder head and valve arrangement is ordinarily not sufficient, nor are the gasoline engines usually built heavy enough to stand the maximum explosive pressures, which often reach 600 and 700 lb. per square inch. With the increase in weight for the same sized engine designed to use alcohol instead of gasoline comes an increase in maximum horsepower of a little over 35 per cent., so that its weight per horsepower need not be greater than that of the gasoline engine, and probably will be less.

The work was taken up to investigate the characteristic action of fuels used in internal combustion engines with a detailed study of the action of each fuel (gasoline and alcohol), as governed by the many variable conditions of engine manipulation, design and equipment. These variables were isolated, so far as possible; their separate and combined effects were determined; worked out under practical operating conditions, and lead up to the conditions required for minimum fuel consumption. The results show the saving that can be obtained over conditions for maximum consumption, and also establish a definite basis of comparison under conditions most favorable to each fuel. This latter is a point of much commercial interest, and a study of the comparative action of gasoline and alcohol may be of great service in solving some of the general internal combustion engine problems where other than liquid fuels are used.

A large number of fundamental tests were necessary in order to clearly define conditions and interpret results. In a way they follow the work conducted by the Department of Agriculture, supplementing to a certain extent, but not duplicating bulletin 191, which gives much data of general value.

Many of the tests of internal combustion engines have been made, but most of them, especially in this country, were by private concerns, for a specified purpose, and the results are not generally available. Furthermore, as is generally recognized by those familiar with gas and especially gasoline engine operation, the conditions influencing engine performance are so numerous and varied

as to make the value of off-hand comparison very limited, and oftentimes misleading, exact comparisons only being possible under identical conditions or with reference to the actual known differences in all conditions that influence the results.

With a view to supplying the continually increasing demand for more complete and exact information concerning the operation and design of gasoline and alcohol engines, and to assist the Government and others interested in the larger and more general internal combustion engine problems, this investigation was made.

The Foundrymen's Convention at Toronto.

The secretary, Dr. Richard Moldenke, Watchung, N. J., makes a general announcement concerning the convention of the American Foundrymen's Association, to be held at Toronto, June 8 to 12, 1908. Arrangements are being made for reduced rates, with possible stop over at Niagara Falls. Instead of the reading of elaborate papers the association will return to the old order and discuss live subjects pertaining to foundry practice. Some of these have been selected and speakers have been appointed to introduce them. Members are asked to send in questions of special interest which they would like to have discussed. The technical sessions will be held in a building separate from that containing the exhibits of foundry machinery and supplies. The Associated Foundry Foremen meet Monday evening, June 8. On Tuesday afternoon the convention and exhibition will be formally opened by the Lieutenant-Governor of Ontario, at a joint meeting of the American Foundrymen's Association, the American Brass Founders' Association, the Associated Foundry Foremen and the Foundry Supply Association. During some of the sessions for business and discussions the exhibition will be closed, so that there may be a full attendance at the meetings. On Tuesday evening occurs the official reception at the City Hall and the local committee has arranged excursions or other forms of entertainment for Thursday evening, Friday afternoon and Friday evening.

Harbison-Walker Brick for Carnegie Schools.

The Harbison-Walker Refractories Company, Pittsburgh, Pa., has closed a contract with the trustees of the Carnegie Technical Schools, in that city, for over 2,000,000 high grade light colored front building brick, for use in the erection of additions to the great group of buildings founded through the generosity of Andrew Carnegie. About three years ago this company, which is the largest manufacturer of fire clay, silica, magnesia and chrome brick in the world, erected a special plant at Templeton, Pa., for the manufacture of high grade front building brick exclusively, and its success has been most gratifying. The company has furnished millions of these brick to important buildings in New York and in other parts of the country.

On account of the magnitude of the order placed by the Carnegie Technical Schools there was unusually strong competition on the part of all the manufacturers of first quality front brick, and the success of the Harbison-Walker Refractories Company in securing this contract is, therefore, all the more pronounced, and speaks well for the high quality of the brick, as nothing but the best was considered. In line with the policy of the company in the manufacture of refractory materials, its front brick plant at Templeton was built on a large scale and is capable of filling the largest orders in quick time. Speed of delivery was a most essential point in the placing of this contract.

Figures have just been compiled from the payrolls of some of the Pennsylvania anthracite coal mining companies showing the earnings of capable contract miners since the October panic. These figures indicate that the anthracite mine workers have fared better during the business depression than almost all other classes of labor. At one of the large collieries in the middle field the net earnings of 60 efficient miners were computed; the table shows that each earned, on the average, $4.44 for every working day. Several of them earned more than $100 a month for the three months considered. At another colliery there were six miners who earned, respectively, $5.03, $6.14, $6.52, $6.75, $8 and $9.15 a day. The record of 18 capable men at still another mine shows average daily earnings of $4.77.

February Exports and Imports of Iron and Steel.

The February report of the Bureau of Statistics of the Department of Commerce and Labor does not confirm the unofficial figures published early in March relative to the large volume of exports of iron and steel in heavy forms from the Eastern seaboard ports. Nevertheless, the statistics show a gain over the January exports. The total value of exports of iron and steel and manufactures thereof, not including ore, for the month of February was $14,069,249, against $13,643,828 in January. Taking the commodities for which quantities are given, the February total is 81,755 gross tons, against 74,352 tons in January, 85,999 tons in December, 116,308 tons in November and 123,216 tons in October. The following table gives details of the exports of such commodities for February and for the eight months of the current fiscal year ending with February, as compared with corresponding periods of the previous year:

Exports of Iron and Steel.

	February.		Eight months.	
	1908.	1907.	1908.	1907.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	1,676	4,743	36,295	56,199
Scrap	693	1,254	11,171	8,876
Bar iron	1,124	4,881	10,987	36,821
Wire rods	972	31	4,602	2,620
Steel bars	2,868	3,533	47,965	24,426
Billets, blooms, &c.	21,744	4,193	56,269	79,601
Hoop, band, &c.	588	200	7,603	4,528
Steel rails	8,949	20,987	221,125	195,635
Iron sheets and plates	3,946	3,595	29,881	17,264
Steel sheets and plates	4,647	5,948	42,134	62,709
Tin and terne plates	173	590	5,033	3,437
Structural iron and steel	9,337	8,838	93,809	78,297
Wire	11,278	14,112	108,621	110,244
Cut nails	187	516	3,745	5,010
Wire nails	3,764	3,530	27,155	24,814
All other nails, including tacks	353	643	4,383	4,405
Pipes and fittings	9,456	10,318	126,687	84,273
Totals	81,755	87,912	837,465	799,159

The imports of iron and steel show quite a decline, as the total value for February, not including ore, was $1,697,525, against $2,076,766 in January. The total of imports of commodities for which quantities are given was 19,054 gross tons, compared with 28,008 tons in January, 20,255 tons in December and 35,255 tons in November. The following table shows the details of the imports of these commodities for February and for the eight months of the current fiscal year ending with February, as compared with corresponding periods in the previous year:

Imports of Iron and Steel.

	February.		Eight months.	
	1908.	1907.	1908.	1907.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	8,031	53,669	181,062	336,689
Scrap	398	725	16,532	12,744
Bar iron	3,943	3,998	28,566	27,395
Rails	....	105	2,181	3,129
Hoop, band, &c.	59	13	286	4,058
Billets, bars, and steel in forms n.e.s.	429	1,211	12,730	14,023
Sheets and plates	117	1,090	1,805	2,521
Tin and terne plates	5,134	2,235	37,040	38,140
Wire rods	903	1,509	10,100	11,675
Structural iron and steel	40	173	1,325	8,355
Totals	19,054	64,728	291,627	458,729

The imports of iron ore in February were 80,094 gross tons, against 97,112 tons in February, 1907. Imports of ore from Cuba were 52,951 tons, against 49,070 tons in February, 1907.

The total value of all kinds of exports of iron and steel, not including iron ore, in the eight months ending with February, was $130,575,718, against $115,606,590 in the corresponding period of the previous year, while similar imports were, respectively, $21,170,314 and $26,610,428.

PERSONAL.

At the recent annual meeting of the stockholders of the Massachusetts Fan Company, Watertown, Mass., Horace Chenery was elected president and D. K. Bartlett, treasurer. Mr. Bartlett will have general charge of sales and manufacture. The business of this company is now in a flourishing condition, having been nearly trebled in the last three years.

Peter Boyd, general superintendent of the National Tube Company, who has been making a tour of the Pacific coast, is visiting the San Francisco office, which is in charge of G. S. Garritt, Pacific coast sales agent.

The Carnahan Tin Plate & Steel Company, Canton, Ohio, announces that on February 1 A. B. Clark assumed the office of general manager, and G. F. Thomas the position of manager of sales.

F. H. Brown, formerly of the Brown & Zortman Machinery Company, Pittsburgh, Pa., but who for some time has been conducting a machinery business under the name of the F. H. Brown Machinery Company, 1206 Park Building, Pittsburgh, has disposed of this to accept the position of manager of sales with McDowell, Stocker & Co., machinery dealers, 16-18-20 South Jefferson street, Chicago.

H. E. Frazier, of Cincinnati, has been elected vice-president, general manager and one of the directors of the American Steel & Iron Company, Norwalk, Ohio, formerly the Norwalk Steel & Iron Company. As general manager he succeeds S. G. Lockwood, who resigned. The company reports a considerable increase in orders.

John MacCormack, well known to engineers and steam users, and S. E. Bryner, for many years prominently identified with the sales department of the A. A. Griffing Iron Company, Jersey City, N. J., have opened an office at 718 Broadway, Bayonne, N. J., under the firm name of MacCormack & Bryner. They will act as consulting engineers and as sales agents for power plant and steam specialties, engine room and factory supplies and general machinery.

Fred. K. Potter, for many years connected with the Capell Fan Engineering Company, has been appointed manager in the Pittsburgh District for the Sirocco Engineering Company. His offices will be in the Keenan Building, Pittsburgh. It is only recently that the Sirocco fans and blowers have been manufactured in the United States, at the new plant of the Sirocco Company, at Troy, N. Y.

Geo. K. Hamfeldt, formerly general manager of the Midland Steel Company, Pittsburgh, Pa., arrived in New York March 28 from an extended trip in Europe. He expects shortly to sail for the Continent again, having accepted an engagement with deWendel & Cie., Germany.

Alfred Pearson has recently been appointed general sales manager of the Pressed Radiator Company, Bailey-Farrell Building, Pittsburgh.

R. D. Hawley, Pacific coast representative of the Railway Supply Company, Chicago, who recently returned from an extended Eastern trip, has opened a new office at 911 Crocker Building, San Francisco.

John A. Topping, chairman of the Republic Iron & Steel Company, has returned to New York from a month's stay in Florida.

Henry Gulick, Jr., and J. W. Henderson have opened offices and laboratories at 439 Third avenue, Pittsburgh, under the name of Engineers' and Founders' Laboratories, as chemists and metallurgists. Mr. Gulick was formerly in charge of the railroad equipment department of Robt. W. Hunt & Co. in the Pittsburgh District, and Mr. Henderson was formerly superintendent of the Central Car Wheel Company and later manager of the plant of the Butler Car Wheel Company, Butler, Pa. They will make a specialty of inspection of railroad equipment and expert foundry work, but are also open for general consultation and for all kinds of analytical and inspection work. They have a complete laboratory for chemical and physical tests of iron, steel, coal, coke, ores, alloys, clays, oils, &c., and are installing appliances for standard cement tests.

Lewis N. Lukens succeeds the late Jawood Lukens as president and treasurer of the Longmead Iron Company, Conshohocken, Pa.

A number of iron manufacturers, among them W. E. Corey, president of the United States Steel Corporation, and J. G. Butler, Jr., of Youngstown, Ohio, are expected to visit the Birmingham District next week.

O. C. Talbot of Toledo, Ohio, has connected himself with the Pioneer Iron & Steel Company, manufacturers' agent, Kansas City, Mo., and is at the head of the structural department.

General Strike of Bituminous Coal Miners.

Owing to the failure of the United Mine Workers of America and the bituminous operators in the various fields to agree upon a wage scale for another year, it is estimated that over 225,000 bituminous coal miners stopped work March 31. It is not believed that a prolonged strike will result. However, there are sharp differences between operators and miners in some districts. In the Southwest District a meeting is being held at Kansas City which may result in an agreement affecting 35,000 men. In the Kanawha field in West Virginia an agreement is probable. President-elect Lewis of the miners' national organization says that no move will be made for some days. In Michigan it was agreed that last year's scale of wages should continue in effect until March 31, 1909. At Pittsburgh it is said that mine owners employing 45,000 miners will insist on a two-year contract, with the sympathetic strike eliminated and with a proviso for arbitration of differences. The open winter and much reduced demand for coal for industrial purposes have resulted in considerable accumulations, and the strike will therefore not be detrimental to manufacturing unless it should be prolonged.

The Westinghouse Machine Company's Receivership Ended.—The receivership for the Westinghouse Machine Company, created last October, at the beginning of the financial depression, was vacated March 31 by Judge James S. Young of the United States Circuit Court, Pittsburgh, on petition of the company and the receivers. The property was turned back to the stockholders April 1, when the company began its fiscal year free from debt, with cash in bank and orders to justify operating the plant on about a 75 per cent. basis, as has been the case all through the receivership, and bright prospects for increasing the output in the near future.

A new company, organized for the manufacture and sale of heating appliances, is the Peck, Anderson & Peck Company, Cincinnati, just incorporated. John K. Peck and Robert E. Peck were prominently identified with the Peck-Williamson Company; A. J. Anderson was for 10 years vice-president of the James McWilliams Company, Louisville; L. D. Ault, another incorporator, is vice-president of the Ault Woodenware Company, Cincinnati. The capital stock is $50,000. A large building at Court street and Broadway is being refitted for occupancy, and it is expected to begin operations in May. The company will make all kinds of heating and ventilating appliances.

The Westinghouse Electric & Mfg. Company, Pittsburgh, has received orders for about 100 mining locomotives, to be shipped to various parts of this country and Mexico. Their capacities run from 4 to 30 tons. Among the orders placed are those of the Crescent Coal Company, Pittsburgh, for five; Lehigh Valley Coal Company, six; Birmingham Coal & Iron Company, three, and J. H. Sanford Coal Company, two, for use at Stickton, Pa. Business lately has been of a most encouraging nature. One of the orders received within the past few days comes from the Rio Janeiro Tramway, Light & Power Company, for 10 double electrical equipments for use on street cars.

Tool Rooms.

Equipment and System.

BY C. L. GOODRICH.*

Keeping track of the small tools used in a machine shop pays, as a considerable saving in time and consequent saving in the cost of producing work result when materials and tools can be quickly obtained. Fewer duplicate tools are required when a systematic check of their location is kept, but it is desirable that a sufficient number in proper working condition be always available for the average demand at least.

The stock of tools, &c., needed depends upon the work produced. This article enumerates most of the common tools and the number of each which answer for a department of about 75 men building small automatic and hand turret lathes and similar work. The large number of drills and counterbores are required because multiple spindle drilling machines are used to quite an extent. Very little milling, planing or gear cutting is done in this department, so that very few tools for such work are kept in the tool room. The list of tools follows. (Of material that is continually being used up, such as files, emery cloth, &c., there is a stated amount that is kept on hand.):

A Typical Equipment.

Air drills:
- For 1-in. drills....3
- For ½-in. drills....2

Air hammers....2
Air hose, 30-ft. lengths....4
Alphabets (steel punches), 3-64, 5-64, ⅛ and 3-16 in. sizes....2 each.
Arbors for milling machine cutters (standard):
- ⅞-in. hole....2
- 1-in. hole....4
- 1¼-in. hole....3

Arbors, old, for turning to special sizes (assorted)....52
Arbors or mandrels:
- ½ to 11-16 in. by 1-16's....3 each.
- ¾ to 1 5-16 in. by 1-16's....4 each.
- 1⅜ to 1⅞ in. by 1-16's....3 each.
- 2 to 2⅜ in. by 1-16's....3 each.
- 2½ to 2⅞ in. by ⅛'s....2 each.
- 3 to 4 in. by ¼'s....1 each.

Awl for punching holes in belt lacing....1
Belt lacing, 4-ft. lengths....20
Belt punches....2
Bench lathe collets, ½ to ½ in. by 1-32's....2 sets.
Bit braces, 10-in. swing....3
Ball joints and connections for boring (assorted sizes)....10 pairs.
Babbitt metal in 1-in. square bars, 8 in. long....20
Counterbores for screws, 3 per set:
- 1, teat size = tap drill; large dia. = body size; ⅛ to ½ in. by 1-16's....8 each.
- 1, teat size = tap drill; large dia. = head size; 9-16 to ¾ in. by 1-16's....6 each.
- 1, teat size = body size; large dia. = head size; 1 3-16 to 1 in. by 1-16's....4 each.

Cutting-off tool holders and tools....6
Center turning fixtures....2
Chalk....2 lb.
Center reamers, 4 sizes....8 each.
Center drills, 4 sizes....12 each.
Center drills and reamers (Slocum), 4 sizes....8 each.
Combination 3-jaw chucks:
- 4-in....2 each.
- 6-in....3 each.
- 9-in....5 each.
- 12-in....5 each.
- 15-in....2 each.
- 18-in....2 each.

Combination 4-jaw chucks:
- 6-in....2 each.
- 9-in....2 each.
- 12-in....2 each.
- 15-in....1
- 18-in....1

Clamps, wooden, 6 sizes, 3 to 12 in. opening....4 each.
Chucks for small drills, 0 to 5-16 in....8
Clamps, machine and parallel, 2 to 6 in....4 each.
Drills:
- Straight shank twist:
  - Nos. 1 to 60....8 each.
  - A to Z....4 each.
  - 1-64 to ¼ in. by 1-64's....8 each.
- Taper shank (tap drill sizes):
  - ⅛ to ½ in. by 1-16's....10 each.
  - 9-16 to ¾ in. by 1-16's....8 each.
  - 13-16 to 1 in. by 1-16's....4 each.

* Department foreman Pratt & Whitney Company, Hartford, Conn.

Drills:
- Taper shank:
  - 3-16 to ½ in. by 1-64's:
    - Carbon....8 each.
    - High speed....3 each.
  - 33-64 to ¾ in. by 1-64's:
    - Carbon....6 each.
    - High speed....3 each.
  - 49-64 to 1 5-16 in. by 1-64's:
    - Carbon....4 each.
    - High speed....2 each.
  - 1 21-64 to 1½ in. by 1-64's:
    - Carbon....3 each.
    - High speed....2 each.
  - 1 17-32 to 2 in. by 1-32's:
    - Carbon....2 each.
    - High speed....2 each.

Drilling fixtures, Yankee, for small holes (hand)....1
Drilling fixtures, increased speed (power)....2
Drill rod, sizes ⅛ to ¾ in. by 1-32's....3-ft. each.
Dowels, sizes ⅛ to ¾ in. by 1-16's (assorted lengths) 15 to 30 each.
Dogs:
- Bent tail lathe:
  - ⅜, ½ and ¾ in....8 each.
  - 1¼, 1½ and 1¾ in....6 each.
  - 2, 2¼ and 2½ in....4 each.
  - 3 and 4 in....3 each.
  - 5-in....2 each.
- Straight tail, short:
  - ⅜, ½, ¾, 1 and 1¼ in....3 each.
  - 1½, 1¾, 2, 2¼ and 2½ in....2 each.
  - 3 and 4 in....1 each.
- Straight tail, long, for reamers:
  - ⅜, ½, ¾ and 1 in....3 each.
  - 1¼, 1½, 1¾ and 2 in....2 each.

Emery cloth:
- Nos. 60 to 120....20 sheets each.
- Flour and crocus....10 sheets each.

Files:
- Flat, various sizes....12 each.
- Half-round, various sizes....6 each.
- Round, various sizes....4 each.

Figures, Nos. 1 to 9, sizes 3-64, 5-64, ⅛ and 3-16 in....4 each.
File cleaning brushes....6 each.
Gears for lathes....All belonging to the department.
Gauges, cylindrical, ¼ to 2 in. by 1-16's....1 each.
Hack saw holders....2
Hack saw blades....4 doz.
Index fixtures for milling....2
Indicators, work testing....2
Indicator, speed....1
Jaws, soft, for combination chucks:
- 6-in....2 sets.
- 9-in....2 sets.
- 12-in....2 sets.
- 18-in....2 sets.

Knurling tool holders and knurls....3 sets.
Lead taps and taper arbors:
- ⅜ to ¾ in. by 1-16's....2 each.
- 13-16 to 2 in. by 1-16's....1 each.

Lead lap molds for above....1 each.
Levels, spirit....2
Lathe tools for turning and boring, &c., assorted types, 10 to 15 each.
Micrometers, 1 to 6 in....2 sets.
Mandrels (see Arbors).
Milling cutters, slitting, end mills, &c., varies to suit conditions.
Numbers (see Figures).
Oil cans....12
Oil brushes....12
Oil pans, 3 x 5 in....6
Oil, machine....2 gal.
Oil, lard....4 gal.
Prussian blue paint....3 tubes.
Parallels, assorted sizes....20 pairs.
Reamers:
- Solid hand:
  - ⅛ to 1⅛ in. by 1-16's....3 each.
  - 1 3-16 to 1¾ in. by 1-16's....2 each.
- Expansion hand:
  - ½ to 1 in. by 1-16's....2 each.
  - 1⅛ to 1¾ in. by 1-16's....1 each.
- Long straight shank:
  - ⅛ to 1⅛ in. by 1-16's....2 each.
  - 1 3-16 to 2 in. by 1-16's....1 each.
- Taper shank:
  - ⅛ to 1⅛ in. by 1-16's....4 each.
  - 1 3-16 to 2 in. by 1-16's....2 each.
- Taper pins, Nos. 00, 0, 1, 2, 3, 4 and....30 each.

Sockets:
- Presto holders, Nos. 2, 3 and 4, Morse shank....4 each.
- Presto collets, Nos. 1, 2 and 3 hole....12 each.
- No. 4 hole....4

Sockets (Morse inside and outside and sleeves), assorted combinations....50
Shears for sheet metal....1
Straight edges, 12 and 24 in....1 each.
Solder wire....3 lb.
Size blocks, 3-64 to 1 in. by 1-64's....2 each.

Soldering irons, assorted	4
Screw gauges, male and female, 3-16 to ¾ in. by 1-16's	2 each.
Taps:	
Hand (3 per set), sizes:	
⅛ to ½ in. by 1-16's	6 sets each.
9-16 to 13-16 in. by 1-16's	3 sets each.
⅞ to 1¼ in. by ⅛'s	2 sets each.
Pulley, long shank:	
¼ to ⅝ in. by 1-16's	3 sets each.
Tap extensions, 5 sizes	3 each.
Tap extractors, ⅛ to 1 in	2 each.
Tap extractor blades	5 sets.
Taps for oil cups, 3 sizes	3 each.
Tapping fixtures for drill presses	6
Threading tool holders and tools, 3 to 32 per inch	3 each.
Tramming bars	1
Vises for milling machines and drill presses, assorted	8
Wrenches, solid, ⅛ to ¾ in. opening	6 each.
Wrenches, adjustable, 5 sizes:	
To ⅝ in	5 each.
Larger	2 each.
Waste	25 lb.
Wire for springs, 6 sizes	1 coil each.

Tool Keeping Systems.

In most well regulated shops each department has an inclosed section in which the tools are kept. A competent man in charge of this room sees that tools are given out as required and returned in proper shape, and so placed as to be easily found. An alphabetical index book is convenient to list the various tools and the numbers of the drawers and shelves where they belong. This book is particularly useful when the tool room man is absent.

Of the various methods of keeping track of tools the best and most universal seems to be to assign a number to each workman, and issue him a given number of checks bearing this number. When a workman takes a tool from the tool room he leaves a check, which is placed in the compartment where the tool belongs. This makes it possible to locate a given tool at any time, but it also is desirable to know exactly what tools each workman has when he is to be discharged. With the single check system, so far described, every compartment must be looked through, which is time consuming. It is usual to insist that the workman turn in his full quota of checks before paying his wages, but if any have been lost it complicates matters. Many concerns keep the men's checks for them on a board in the tool room and find this more satisfactory, as it shows how many tools are held by each workman. Periodically examining the checks discloses any irregularity, and very little loss of tools results. Still the single check system thus handled only shows how many and not what particular tools each man has out.

By the duplicate check system a check of different contour than the workmen's check is kept with the tool in the tool room, and when that tool is given out the check is placed on the board on a peg beside the workman's number. The workman's checks are kept on an adjoining peg. The total of the checks on these two pegs should always equal the number originally issued to each man. If the workman's checks are round the tool checks are usually square. This system has a moral effect on the men, which any system lacks which does not keep account of what the man has.

The system is rather cumbersome, however, if a check is provided for each tool of the same kind. The distributing of these checks as tools are returned is tedious and they require much space. For instance, in one drawer holding twist drills from No. 1 to 31, if there be eight of each, 240 checks are needed to completely check any possible requirement—*i. e.*, eight No. 1 and eight No. 2 drills wanted simultaneously. The writer, therefore, has modified the system by marking such checks with the drawer or compartment number instead of the tool name or number, thus fewer checks are required and it is much easier to redistribute them. It is practically as easily to locate the tools held by any workman, as his circular check is retained in the place from which the tool is taken.

For special tools, jigs, &c., the writer finds it better to have a duplicate check for each piece and to give the jig number on the duplicate check and also its location and thus facilitate putting away the jig.

Tool Room Conduct.

Each engine lathe in the shop has one set of gears suitable for turning, and when any other gears are required they will be exchanged by the tool room man, who is conversant with gears suitable for cutting threads, &c. This makes it possible to quickly obtain correct gears and avoids accumulating gears on the floor around each lathe. When a man wants waste he turns in his unclean waste for the new. This contributes to economy and neatness, as there is less loss and no loose waste seen in the pans and on the floors.

In designing a tool room the endeavor should be to place special tools in sight, while more common material may be kept in drawers or open compartments not necessarily in sight. The writer permits his assistants to look into the tool index book, which posts them thoroughly as to just what equipment is on hand. The tool room has a drill grinder, and it is the duty of the man in charge to keep all drills sharp. Other tools, if in poor working shape, are put aside and corrected or replaced by other help.

The American Iron and Steel Institute.

There has been incorporated under the laws of the State of New York the American Iron and Steel Institute, the incorporators being Elbert H. Gary, chairman of the United States Steel Corporation; W. E. Corey, president of the United States Steel Corporation; E. A. S. Clarke, president of the Lackawanna Steel Company; E. C. Felton, president of the Pennsylvania Steel Company; Powell Stackhouse, president of the Cambria Steel Company, and C. M. Schwab, chairman of the Bethlehem Steel Company. The directors until its first annual meeting are the incorporators and the following: Willis L. King of Jones & Laughlin Steel Company, Pittsburgh; Edward Bailey, Central Iron & Steel Company, Harrisburg; W. J. Filbert of the United States Steel Corporation; John A. Topping, president of the Republic Iron & Steel Company; J. C. Maben, president of the Sloss-Sheffield Steel & Iron Company; W. A. Rogers of Buffalo; J. F. Welborn, president of the Colorado Fuel & Iron Company; T. J. Drummond of Montreal, and Samuel Mather of Pickands, Mather & Co., Cleveland.

The constitution of the new society recites that its objects "shall be to afford a means of communication between members of the iron and steel trades upon matters bearing upon their business interests." The institute is to be managed and controlled by a Board of Directors consisting of 15 members, and the regular annual meeting shall be held on the first Monday of May of each year. All men engaged in and prominently identified with the steel and iron trades will be eligible to membership, and provision is made for honorary members to the number of not exceeding 50.

The first officers of the institute are:

PRESIDENT, E. H. Gary.
FIRST VICE-PRESIDENT, Powell Stackhouse.
SECOND VICE-PRESIDENT, C. M. Schwab.
THIRD VICE-PRESIDENT, Willis L. King.
SECRETARY, W. J. Filbert.
TREASURER, Edward Bailey.

A meeting of the directors is to be held on Thursday, April 2, to pass finally upon the by-laws, and it is probable that the details of the organization will be announced at the banquet which is to be given on Thursday evening by Judge Gary at the Waldorf-Astoria.

The scope of the new institute is a very wide one, and in that respect differs radically from the British institution which deals exclusively with technical subjects, and does not in any way touch commercial or economic topics. The discussion of these will be the principal field of the new institute, which is expected to wield a beneficent influence in the American iron industry.

The rolling mill of the Tennessee Coal, Iron & Railroad Company at Bessemer, Ala., has been put in operation after a suspension of about six weeks. The company's rail mill at Ensley will suspend operations April 1 for the installation of new machinery.

OBITUARY.

WILLIAM H. PFAHLER.

William H. Pfahler, who has for many years been prominently identified with the foundry trade, died at Pasadena, Cal., March 29. He was born at Columbia, Pa., March 26, 1842, and was educated at the Millersville Normal School, Millersville, Pa. He engaged in the tin and stove business with his father at Columbia and in 1861, at the age of 19 years, enlisted in the 45th Regiment of Pennsylvania Volunteers. He served through the war and was mustered out with the title of brevet major. He then opened a hardware store at Columbia under the style of Pfahler & Herr, afterward purchasing the interest of his partner. He continued in this business until he accepted the position of general manager of the Keeley Stove Company, Royersford, Pa., subsequently removed to Columbia. In 1886 he accepted the position of superintendent of the Abram Cox Stove Company of Philadelphia, afterward becoming its treasurer, from which position he retired in 1905, but was still a director of the company at the time of his death. In 1906 the Model Heating Company was formed, to take over the house heating boiler business of the Abram Cox Stove Company and he was made its treasurer. At the time of his death he was president of that company and also president of the Reading Radiator Company.

He was a member of the Union League of Philadelphia, honorary member of the Administrative Council of the National Founders' Association, honorary member of the Administrative Council of the National Metal Trades Association, served on the original Executive Committee of the National Civic Federation, was a director of the City Trust Company of Philadelphia and a member of the Loyal Legion. Although not actively identified with the management of the Stove Founders' National Defense Association, Mr. Pfahler was a careful observer of its work, and in that way became deeply interested in the settlement by conciliation of questions arising from the relations of employers and molders. Shortly after the organization of the American Foundrymen's Association at Philadelphia in 1896, he came to the conclusion that the time was ripe for introducing in the general foundry trades the methods which had been adopted by the stove founders in settling labor troubles and seized the opportunity afforded by a meeting of Western foundrymen in Cincinnati in October, 1897, to present his views. The proposition was not deemed one which could be taken up by the American Foundrymen's Association, but a new organization was formed to handle labor questions under the name of the National Founders' Association. Of this new organization Mr. Pfahler was the first president, and took a prominent part in its affairs for a number of years. He also assisted in the organization of the National Metal Trades Association, for the purpose of inculcating his ideas in the minds of employers in the machinist trade. He was a close student of economics and a forcible speaker, possessing that personal magnetism which carries conviction. Few men have so impressed their personality on the foundry trade as Mr. Pfahler. In recent years his health has prevented him from taking the prominent part in the discussion of labor questions which he would otherwise have been impelled to do by reason of his ripe experience, sound judgment and intense zeal in his life long purpose of bringing about better relations between employers and employed. He leaves a widow, one daughter and one son, the latter being A. E. Pfahler, treasurer of the Model Heating Company.

FERDINAND PHILIPS, president of the Philips Pressed Steel Pulley Works, and senior member of the firm of Philips, Townsend & Co., Philadelphia, died in that city March 26, after a short illness. He was born in Elberfeld, Rhein Province, Germany, in 1850. He came to this country when a young man, and was for a long time connected with Hoopes & Townsend, Philadelphia. In 1883 he established the firm of Philips, Townsend & Co., which was the first to engage in the manufacture of wire nails in Philadelphia. He was an engineer and inventor of high attainments, making numerous inventions, one of his latest being the well known Philips pressed steel pulley. He leaves a widow.

JOHN A. BRILL, one of the founders of the J. G. Brill Car Works, Philadelphia, died in that city March 25, after an illness covering a period of several years. He was born in Philadelphia in 1852, and entered the works of his father, J. G. Brill, at an early age, and was later in charge of the department of sales. He gave the matter of car trucks special attention, and his inventions embrace many of the features of car trucks in use in electric transportation at the present day.

Steel Scrap Specifications.

Steel manufacturers and scrap dealers will alike be interested in the following specifications for open hearth melting scrap, which have been issued in printed form by the Lukens Iron & Steel Company, Coatesville, Pa.:

Class Specifications.

First: Shipments must be made in flat bottom gondola or box cars.

Second: Shipments must be made at the rate specified by us. Excess shipments will be held on cars and the demurrage charged to the shipper.

Third: All advance charged (regular freight charges excepted), must be paid by shipper before cars will be accepted.

Fourth: Written notice of the shipment of every car must be mailed on day of shipment from point of shipment to this company. Such notices must give the car number, and the gross, tare and net weights should be mentioned if possible. Cars for which notices have not been received will not be unloaded, and any demurrage charges resulting will be charged to shipper.

Scrap Specifications.

No. 1 heavy steel scrap, long: Straight rails over 5 ft., frog, switch and guard rails, cut apart; straight structural up to 12 in. wide and over 5 ft. long, cut apart; straight bars and axles from 1 in. diameter to 4 in.

No. 1 heavy steel scrap, short: Heavy railroad steel in charging box shape, rail, bloom, billet and structural crops under 5 ft. in length and 500 lb. weight, flat boiler plate ¼ in. and heavier, cut in charging box sizes, not over 20 in. wide and 5 ft. long, structural material, straight, not over 5 ft. long.

No. 2 steel scrap: Cut yard scrap ¼ in. thick and heavier, all charging box shape, heavy punchings, skate scrap and all good heavy clean shoveling scrap; no light, tangled or badly rusted scrap included.

No. 3 steel scrap: Bundled sheets in compressed packages, light shoveling, bundled skeleton.

No. 4 steel scrap: Frogs and switches not cut apart, structural material not cut, flat boiler plate not cut and other material of similar shape.

Note No. 1: No mixed cars of scrap (that is long and short) will be received except by special agreement in writing.

Note No. 2: Where short scrap and shoveling are in same car, the shoveling must be in one end or bottom of car; if on top will be sufficient cause for rejection.

Note No. 3: Heavy turnings, malleable railroad, detinned billets, car wheels, both iron and steel, cast iron scrap, all are special and not within any above classification.

The Nevada-California Power Company, Goldfield, Nev., is preparing to install a fourth Allis-Chalmers alternating current generator of the water wheel type, having 1500 kw. rated capacity, to augment the enlarged power service now contracted for in the vicinity, pending the completion of its new hydro-electric stations on Bishop Creek, Inyo County, California. Current from these generators is transmitted 113 miles at 60,000 volts to Tonopah and Goldfield, Nev., with branches from this line to other points, and supplies power to a number of the mines in that district whose equipment is electrically operated.

NEWS OF THE WORKS.

Iron and Steel.

Howard H. Houston has been appointed receiver for the Tidewater Steel Company, Chester, Pa.

General Machinery.

The Colburn Machine Tool Company, Franklin, Pa., has received contracts for a number of its vertical boring and turning mills for shipment to Germany. The company reports inquiries more numerous than for some time, and reports the outlook for future business as fairly promising.

The Fairbanks Steam Shovel Company, Marion, Ohio, advises us that the entire output of its plant for the past three years has consisted of dipper dredges rather than steam shovels. As these dredges are used for land reclamation and as recent financial depressions have not affected land values there has been no falling off in its business; in fact, the company has nearly twice as many orders on hand now as at any time previous, and expects to put on a night force and run its shops double turn in the near future.

At the annual meeting of the Standard Roller Bearing Company, Philadelphia, Pa., Samuel S. Eveland was elected president; W. B. Osgood and Lenox Smith, vice-presidents, and William N. Baldwin, treasurer.

The Sheffield Stove & Foundry Company, Sheffield, Ala., is in the market for the following second-hand machinery for its stove foundry for making iron castings: Exhaust tumbling mills, exhaust fan, 1 15-16-in. shafting and hangers, emery stands, drill presses and other equipment.

The business of the Curtis & Curtis Company, Bridgeport, Conn., manufacturer of the Forbes patent die stock, continues to show encouraging signs of improvement. Unusually large shipments have recently been sent from the works on export delivery, which included six machines to Russia, five to Australia, five to England, four to Kobe, Japan; four to Yokohama, Japan; three to Mexico and several to South America and British Columbia. This, with a fair domestic business, is very gratifying to this well-known house.

The Thomas Carlin's Sons Company, 1600 River avenue, Allegheny, Pa., manufacturer of shears, grinding pans, contractors' equipment, &c., is furnishing the P. W. Finn Company a 9 x 12 in. double cylinder, double drum hoisting engine and two large derricks, one having a 90-ft. beam, with a capacity for lifting 10 tons, for use in erecting the new Memorial Hall, Pittsburgh. The company also has an order for two large steel derricks and two 9 x 12 in. triple drum hoisting engines, to be shipped to the Ball-Carden Company, Dallas, Texas.

Power Plant Equipment.

The Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., through its export department, has received a contract from the Dominion Iron & Steel Company, Halifax, N. S., for a 500-hp. electric generator, which will be used in the operation of one of the company's iron mines on Belle Island, Newfoundland.

The Hartford City Electric Light Company, Hartford City, Ind., has in contemplation some plant changes and improvements that may later on require the purchase of additional equipment. No definite plans have, however, yet been formulated to this end.

The Harlowton Light & Power Company, Harlowton, Mont., of which L. D. Glenn is secretary, has been incorporated with a capital stock of $30,000. F. F. Goss, Lewistown, Mont., is general manager.

The Huntington Park Gas & Electric Company, Los Angeles, Cal., has been incorporated with a capital stock of $200,000 for the purpose of constructing an electric light and gas plant. The former will be equipped with a 65-kw. generator, to be driven by 120-hp. twin engines, and the gas plant is designed to have a capacity of 20,000 ft. per hour. Contract for the construction of the gas plant exclusive of the pipe line has been awarded to E. A. McGillivary, and it is stated that the Western Gas Engine Company will probably secure the contract for the electric plant. Henry F. Leukfeld, Los Angeles, Cal., is president of the new company.

The city of Hartley, Iowa, voted on March 9 to issue bonds for $12,000, the proceeds of which when sold are to be used in the erection and equipment of an electric light and power plant. F. R. Lock is mayor.

Creditors of the Niles Boiler Company, Niles, Ohio, for which H. S. Pell was recently appointed receiver, have been directed by the court to file their sworn claims with the receiver by April 30.

Bridges and Buildings.

The Riter-Conley Mfg. Company, Pittsburgh, builder of steel construction, has secured a contract for the erection of an addition to the Erie City Iron Works, Erie, Pa., which includes a steel frame building 64 ft. 4 in. wide, 400 ft. from center to center of end columns, and 38 ft. 6 in. high under trusses.

Foundries.

An involuntary petition in bankruptcy has been filed against the Darlington Foundry Company, Darlington, Beaver County, Pa.

Fires.

The plant of the Leach Windmill Mfg. Company, Joliet, Ill., was burned March 22, the loss being about $10,000.

Hardware.

The National Wire & Metal Mfg. Company, Oklahoma City, Okla., has recently been incorporated with a capital stock of $5000, and will engage in the manufacture of wire baskets and chicken coops. The officers of the company are as follows: Geo. J. Eacock, president; Guy Miller, vice-president; W. E. Seaman, secretary and treasurer; J. M. Narsh, manager.

The Sidney Steel Scraper Company, Sidney, Ohio, now has its remodeled factory in full operation, which gives an increase in output of 50 per cent. over that of the former plant. The new works are run entirely by electrical power and have the latest improved sprinkler system of fire protection.

Duane H. Nash, Inc., Millington, N. J., manufacturer of the well-known Acme pulverizing harrow, has just completed its most successful season in the Southern States. The factory is now running to its fullest capacity getting ready for Northern trade, and the indications, we are advised, point to a record year in sales of the harrows.

Miscellaneous.

The Home Water Works Company, Spencer, Ind., recently incorporated with a capital of $20,000, has under consideration the construction of a new water works plant at that place. These plans have not been fully developed. The directors of the company are John R. Thomas, J. F. Lawson and J. H. Smith.

The Just Right Light & Furnace Company, Wakarusa, Ind., has been incorporated, with a capital stock of $10,000, and will engage in the manufacture of gasoline lights and furnaces for residences, churches, stores, &c. The officers of the company are W. O. Yarian, president; Jacob Helmkee, vice-president; R. E. Myers, secretary and treasurer.

The Detroit Copper & Brass Rolling Mill Company, Detroit, Mich., has increased its stock from $1,000,000 to $1,500,000.

In order to properly handle its increased volume of business the Standard Brass Works, Detroit, Mich., has increased its capital stock from $5000 to $30,000.

The E. A. Humphries Coal & Coke Company, Scottdale, Pa., has completed a modern mining and coke plant at Bradenville, Pa., on land recently acquired. Forty ovens of the Mitchell type have been completed and are ready for operating when market conditions justify. The company at a recent meeting elected the following officers: E. A. Humphries, president; R. J. Humphries, vice-president; J. M. Zimmers, secretary and treasurer.

R. S. Armstrong & Bro., Atlanta, Ga., iron brokers and machinery dealers, in order to accommodate their increasing trade, have found it necessary to erect an addition to their ware house and are building a handsome two-story mill construction building, 80 x 100 ft., which will double their capacity.

The Milwaukee, Wis., School Board has placed contracts with the Dow Wire & Iron Works, Louisville, Ky., for the erection of chute fire escapes on 24 school buildings, at a total cost of $19,470.25. The escapes are of the standard patent Kirker-Bender type.

The Burley Heater Company, Tyrone, Pa., manufacturer of the Burley steam and hot water heaters, advises us that it has again established its factory at Tyrone and now has one of the best equipped boiler plants in the country, with splendid facilities for receiving and shipping. New machinery is in full operation and the company is accumulating stock for the 1908 heating season. Arrangements for opening a Philadelphia sales office and warehouse are now under way, and the company expects to push the sale of Burley steam and hot water boilers with much vigor in the future. C. Imhof is secretary.

The business of the old established house of the Williams Stove Lining Company, Taunton, Mass., manufacturer of brick stove linings and Eagle stove clay, has been incorporated under Massachusetts laws, with capital stock of $25,000. The incorporators are Joseph S. Williams, John G. Williams and Sarah E. Williams. There will be no change in name or management.

The recent fire at the plant of the Penn Spring Works, Baldwinsville, N. Y., completely destroyed the building, a one-story frame structure 70 x 400 ft. The loss is entirely covered by insurance and the plant will be rebuilt, although the location for the new building has not been decided upon. The machinery used in the plant is mostly of special manufacture, and the equipment to be purchased will include transmission machinery, pulleys, shafting, hangers, &c.

The Walton Cement Stone Company, Albion, Pa., recently organized, will equip a plant for the manufacture of building blocks, porch columns, &c. W. H. Walton is president and C. H. Smith, secretary and treasurer.

The Ruud Mfg. Company of Pittsburgh, Pa., has moved into its new building at Twenty-ninth and Smallman streets. The building is a four-story structure, 120 x 120, and is equipped with everything that is modern for the manufacturing of water heaters.

The Massachusetts Fan Company, Watertown, Mass., is furnishing for the Clarendon Clay & Mining Company, North

Clarendon, Vt., a complete hot blast outfit for drying Kaolin. The apparatus consists of a steam heater and one of the Massachusetts ball bearing fans. The adaptability of the type of fan is shown by the fact that when the balls are once packed in vaseline no further attention is required for at least six months.

Indianapolis Industrial Notes.

INDIANAPOLIS, IND., March 30, 1908.—The Indiana capital city has weathered the half year of depression and industrial falling off with flattering success. Inquiry in the manufacturing districts and among the hardwaremen and iron and steel trades shows that the recessions in trade have not been so great as in some of the Eastern cities, and the recovery has in the main been more rapid and satisfactory.

President Martindale of the Shirley Radiator & Foundry Company speaks encouragingly of the future, and decries the prevailing fault among some manufacturers of allowing themselves to be affected by hard times talk. He expresses himself as believing that the tendency of the times is toward a sound, safe, conservative resumption of business in all lines, and that it is not many months off.

President L. M. Wainwright of the Diamond Chain & Mfg. Company is a careful statistician on business records at his large plant, and has compiled figures from returns in the sales department which indicate to him that 1908, if the recovery is as rapid as it evidences in the start, will show about the normal of former prosperous years; in other words, that of 1906, and may perhaps reach the figures of 1907. The fine four-story addition to the plant, which was completed about the first of the year, is now being pressed into service gradually, and with this modern department the plant covers one entire side of a city block. One of the newest features of the Diamond Chain Company's specialty department is the Diamond repair block, a device for detaching the links of riveted roller chains, making the removal of links or rivets a quicker operation than can be performed with detachable chains.

At the plant of E. C. Atkins & Co., on South Illinois street, where silver steel saws are made and marketed, both President Atkins and Advertising Manager Benham were found deep in the details of new and original advertising campaigns, and, considering the conditions of trade, were quite pleased with the outlook. This concern has also found sufficient time during the months of recession and return to normal conditions to get out some new things, which will soon be announced.

Another of the local establishments which has felt but slightly the changed conditions of the half year is the Indianapolis Drop Forging Company, Madison avenue and Downey street. President and Manager H. J. Martin is quite conservative, and while reporting that business is "fair" qualified it with the statement that the company is running with but a few short of its regular force, and on a 44-hour per week schedule—eight hours per day, instead of the usual 10. The plant is now on a booking of three months' contracts ahead; at this time last year (an abnormal period with most plants) the orders were six or seven months ahead. The company makes forgings of from a few ounces to about 25 lb.

There is a noteworthy increase of activity in structural iron circles. At the works of the Noelcke-Richards Iron Company, Contracting Manager G. F. Beckerly was found busy with the details of some things in building which are expected to assume tangible form on the first of the coming month. The plant has run uninterruptedly through the holiday and slack period, and if some more of the large projects outlined in the early fall of 1907 are taken up, as is now anticipated, this concern, along with others in the same trade, expects to see normal conditions ere the close of 1908.

At the new and modern eight-story establishment of the Van Camp Hardware & Iron Company, every department was found busy, and the heads of departments and officials especially so. Samuel Van Camp has recently returned from a trip to the Bermudas. Speaking of the ramifications of the hardware trade in general and of his observations on the trip, Mr. Van Camp noted that he saw two or three hardware stores in the Bermudas that would compare favorably in every way with the best stores in the United States. The Van Camp establishment is the one which has gained some considerable renown for its widely announced policy of getting out 75 per cent. of all orders on the day of the receipt of order.

In the line of heavy hardware and iron and steel generally, W. J. Holliday & Co., West Georgia street, find the return to normal conditions gradual, and are confident that present conditions are propitious for the carrying forward of large plans in building and other enterprises. The department of the Holliday business showing encouraging increase in activity and suggesting returning confidence among large builders is that devoted to structural irons, and with the large number of inquiries and published statements of improvements going ahead, it is believed that the rounding out of the last half of the year will present some interesting new records.

The Indianapolis Foundry Company, of which Frank W. Lewis is president, James I. Dissette vice-president and treasurer, and Fred. B. Whitlock secretary, has but recently celebrated its twenty-fifth anniversary. In this period enough has been accomplished to have warranted the installation of a four-cupola foundry, with floors for 250 molders and in all 450 employees, with a capacity of 80 tons per day. This melt, in line with all other foundries in the country, has fallen off somewhat, keeping pace with the times and slack conditions in the machinery trade. The company makes no specialties for the market, as do some other establishments of the same kind, confining its business to fine light gray castings to order.

Among the larger building enterprises outlined for early consummation in Indianapolis and about ready for the asking or awarding of bids, are the Masonic Building on Illinois street, in which a low pressure heating system is to be installed—Rubush & Hunter, architects; the building of the Young Women's Christian Association, which will require about 300 tons of structural steel, and the Young Men's Christian Association Building—Fultz & Parker, architects—which will require more. The power plant for this last building has been purchased. The Atlas Engine Works will furnish the boilers and the Chandler & Taylor Company the engines.

The Middletown Car Works, Middletown, Pa., has secured an extension of time from its creditors, an agreement having been signed by all creditors whose claims exceed $100 to give the company until January 1, 1909, to pay such indebtedness, with 6 per cent. interest. A committee of creditors, composed as follows, will control the stock of the company in the meantime and thus have supervision over its affairs: James Lord, F. M. Campbell, E. M. Grove, C. Theodore Buchholz, Ernest Law, F. J. Hall, A. G. Wellington and Frank G. Kennedy, Jr.

The Youngstown Sheet & Tube Company of Youngstown, Ohio, recently contracted for three 500-kw. Allis-Chalmers synchronous motor generator sets, similar in design to those furnished the Jones & Laughlin Steel Company, and intended for operation in connection with two Allis-Chalmers steam turbines and generators, each of 1500 kw. capacity, ordered some time ago.

The National Fire Proofing Company, Pittsburgh, has been awarded a large contract by the Pennsylvania Railroad for underground conduit work for the New York City terminal. The same company recently received an order for 200 miles of conduit work from Belgian interests.

A plant will shortly be erected in western Pennsylvania, probably at Bradford, to demonstrate the commercial value of a process patented by Dr. Henry Spencer Blackmore, Washington, D. C., for converting natural gas into alcohol.

The Iron and Metal Trades

The Steel trade is quiet, and the volume of new business coming to the mills which roll Rails, Plates and Structural Material is light. The export trade, which has been steady, has recently reflected also the slackening demand in the leading industrial countries.

The Rail mills report no orders of consequence, and the additional purchases on the part of the New York Central lines are still pending. In the Plate trade, outside of the orders from locomotive builders, which were placed with an eastern Pennsylvania mill, there has only been some work for Steel Pipe. Two car builders have divided an order for 500 cars for the Lehigh & New England Road.

The Structural mills have had rather a poor month in March, the demand for railroad bridge work being particularly light. The backbone of the business now is what demand there is for buildings.

In the Chicago District about 4000 tons were placed, including 2500 for a viaduct in Milwaukee. Among the new work coming up is a lot of 7000 tons for the State Regents Building at Albany. A few small lots have been let for the Pacific Coast. Fabricators are competing sharply, prices being down to the level of $50 to $52 per net ton now, as compared with $58 to $60 per net ton a year ago, with the cost of material unchanged.

In some sections the demand for Steel Billets, Sheet Bars and Forging Billets has been somewhat stimulated by the absorption on the part of the mills of one-half of the freight charges.

There has been sharp competition between the mills which make light rails by rerolling and by the mills which roll from Billets, and prices have receded to $23, at mill.

A Youngstown mill has secured the order for a considerable tonnage of Merchant Pipe, for the Panama Canal, and further work of this character is expected from the same quarter.

While the Bar trade is very quiet, and the Sheet trade is not as active as anticipated, the Tin Plate trade is holding very well. The leading interest has 85 per cent. of its capacity in operation.

In some sections there has been increased buying of Foundry Iron, but the bulk of the business is being done by Alabama furnaces, on the basis of $12 to $12.25, Birmingham, and by Virginia furnaces, on the basis of $14 to $14.25, at furnace, for No. 2. For the first time figures, apparently from an authoritative source, are being quoted with reference to stocks of Pig Iron in the hands of merchant furnaces and of the Steel companies. They seem large, but it is impossible to judge of their significance in the absence of data relative to stocks for former periods.

Quite a number of fair sized contracts have been placed for Cast Iron Pipe, but the prices at which they are being let are so low that some leading makers are pulling out of the market.

Copper has receded, and Electrolytic is now available for domestic consumption at 13c., while a shade lower can be done for export.

Little attention is paid in the Iron industry to the coming cessation of operations in some of the Western Bituminous Coal mines. It is not expected to last long enough to cause any inconvenience.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Apr. 1, 1908.	Mar. 25, 1908.	Mar. 4, 1908.	Apr. 3, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$17.75*	$17.75	$18.25	$24.50
Foundry No. 2, Southern, Cincinnati	*15.25*	15.25	15.75	26.00
Foundry No. 2, Local, Chicago	17.50	17.50	17.50	26.00
Bessemer, Pittsburgh	*17.75*	17.75	17.90	22.85
Gray Forge, Pittsburgh	*15.65*	15.90	15.90	21.60
Lake Superior Charcoal, Chicago	*20.50*	20.50	21.50	26.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	30.00
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila	*29.20*	29.20	30.40	31.50
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	*12.00*	12.00	12.25	18.00
Steel Rails, Melting, Phila	*12.75*	12.75	14.00	19.00
Iron Rails, Chicago	*15.00*	15.00	16.00	25.00
Iron Rails, Philadelphia	*17.00*	17.00	18.00	27.00
Car Wheels, Chicago	*14.50*	15.50	15.50	25.00
Car Wheels, Philadelphia	*14.00*	14.00	16.00	24.00
Heavy Steel Scrap, Pittsburgh	*13.00*	13.00	13.75	18.00
Heavy Steel Scrap, Chicago	*11.25*	11.25	11.50	16.00
Heavy Steel Scrap, Phila	*12.75*	12.75	14.00	18.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.65	1.65	1.65	1.93½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.81½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.70	1.70	1.70	1.90
Skelp, Sheared Steel, Pittsburgh	1.80	1.80	1.80	2.00
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	1.90	1.90	1.90	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**13.25**	13.25	12.50	24.50
Electrolytic Copper, New York	**13.00**	13.25	12.37½	24.00
Spelter, New York	*4.70*	4.75	4.75	6.85
Spelter, St Louis	*4.55*	4.55	4.60	6.65
Lead, New York	**3.97½**	4.00	3.75	6.25
Lead, St. Louis	**3.80**	3.85	3.60	6.05
Tin, New York	**31.25**	32.10	30.25	40.00
Antimony, Hallett, New York	*8.75*	9.50	9.00	23.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, April 1, 1908.—(*By Telegraph.*)

The final summing of results for March will probably show some improvement over February in the aggregate volume of new business entered by the mills, but the measure in which the various products have contributed to this result is by no means uniform. Wire and wire products, reflecting the unimpaired financial strength of the farming communities, continue, in point of activity, far in advance of other lines. The effect of a counter condition in railroad affairs is seen in the relatively small percentage of the aggregate tonnage being taken by these interests. No new Rail orders are reported, but Track Supplies are more in demand, and the urgent requests for prompt shipment that accompany such orders are significant of scanty stocks. Upward of 4000 tons of Structural Material were included in contracts taken by the fabricating shops during the week, and the early closure of about half of the 10,000 tons for the construction of the Corn Products Company's new plant is looked for. Chicago track elevation work planned by various railroads will probably develop a fair sized tonnage later on in the season. New business and specifications are coming out too slowly to permit the continued operation of the Structural mill at the South Works, and it is again shut down. While there is a slight improvement in the movement of Merchant Pipe, Bars, Plates and Sheets, it is not of notable degree in any of these lines. Recent bids on Cast Iron Pipe disclose an extremely low range of prices, which in some cases seem to have been made without regard to profit. With no demand from consumers there is practically nothing doing in Old

Material. Buyers will pay market prices for what little tonnage is actually needed, but decline tempting offers for forward deliveries. Some indications seem to point to an increase in the consumption of Foundry Pig Iron, but such a condition is not yet reflected in the present demand.

Pig Iron.—While no distinctive signs of improvement are observable in the general situation, a somewhat better sentiment has developed. Signs of increasing activity in the stove foundries is to some extent responsible for the hope of an enlarged consumptive demand. There is, however, no appreciable change noted in the character or volume of actual transactions, and instead of any tendency toward greater firmness the market seems to be gradually settling to lower price levels. This is especially true of Southern Irons, which are now obtainable at from $12 to $12.50, Birmingham, for No. 2 Foundry. The Northern furnaces are not inclined to follow the decline in Southern prices, and there is consequently an increasing spread between Northern and Southern quotations. Among the sales reported for the week were two lots of 500 tons each and one of 300 tons of Southern Foundry Iron, the greater part of which, it is understood, was taken at $12, Birmingham. A lot of Northern Iron of special grade, amounting to 1000 tons, was also placed. There is practically no change in the furnace situation in this district. Early resumption of furnaces now out of blast is unlooked for. The following prices are for April, May and June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.50 to $21.00
Northern Coke Foundry, No. 1	18.00 to 18.50
Northern Coke Foundry, No. 2	17.50 to 18.00
Northern Coke Foundry, No. 3	17.00 to 17.50
Northern Scotch, No. 1	18.50 to 19.00
Southern Coke, No. 1	16.85 to 17.35
Southern Coke, No. 2	16.35 to 16.85
Southern Coke, No. 3	15.85 to 16.35
Southern Coke, No. 4	15.35 to 15.85
Southern Coke, No. 1 Soft	16.85 to 17.35
Southern Coke, No. 2 Soft	16.35 to 16.85
Southern Gray Forge	14.35 to 14.85
Southern Mottled	14.10 to 14.60
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	19.40 to 19.90
Jackson Co. and Kentucky Silvery, 6 %	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 8 %	22.40 to 22.90
Jackson Co. and Kentucky Silvery, 10 %	24.40 to 24.90

(By Mail.)

Billets and Rods.—A few small sales are reported, but none of significant tonnage, the demand being limited to small lots to supply needs as they arise. The forge shops are doing little and the demand for Forging Billets shows no material increase. The Chicago, Milwaukee & St. Paul Railroad has purchased 10,000 Iron Car Axles, the order, it is understood, having been placed with the Block-Pollak Iron Company. Under a new arrangement that has been formulated to equalize the disadvantage in freight rates of finishing mills outside of Pittsburgh, the mill absorbs one-half of the freight rate when it exceeds $1 a ton and up to $3 a ton. In conformity with this schedule, quotations for this market are revised, and we quote Forging Billets at $31.50 to $32.50, Chicago. There is a fair demand for Wire Rods, the prices of which continue firm at the following quotations: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—While there are a number of small inquiries in the market for Standard Section Rails, and a few small sales are reported, the aggregate tonnage is very light; nor are there any present indications of a notable increase in the immediate future. Orders for Spikes and Fastenings continue to develop in a moderate way, and it is noted that in almost every instance these are accompanied by requests for prompt execution and shipment. In view of the evident fact that supplies of this character in the hands of the roads are greatly reduced, the prospects for a reasonably fair demand are good. Prices of Spikes and Track Bolts are easier, and are herewith revised. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.25c. to 2.35c., base, Square Nuts; and 2.40c. to 2.50c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—The principal tonnage of fabricated material included in last week's closures was that involved in a contract taken by the Milwaukee Bridge Company for the Washington avenue viaduct, Milwaukee, comprising 2550 tons, the contract price being $215,670. Of the bids offered by the seven interests competing for this work, the highest was $229,550. Among the small contracts awarded during the week were 365 tons for the North Denver High School, taken by the Pittsburgh Steel Construction Company; 200 tons for a draw bridge over the Skagit River, Mount Vernon, Wash., taken by the Morava Construction Company, and a small tonnage for track elevation let by the Illinois Central Railroad to J. T. Ryerson & Son. Fabricators are figuring on what represents the initial requirements for the Corn Products Company's new building at Summit; this will probably be let in a few weeks. A contract for 900 tons of material required by the Chicago, Burlington & Quincy Railroad for track elevation work will likely be let this week. Under the pressure of competition, prices on fabricated material have declined to a point that admits of little or no profit. Specifications are coming in very slowly, and the Structural mill of the Illinois Steel Company, having cleaned up all orders in hand last week, is again idle. Prices from store are quoted without change at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—There is no perceptible quickening in the movement of Plates, nor do the inquiries received give promise of early betterment. The large jobbing interests are taking on no new tonnage save in desultory lots required for stock assortment. In the main the limited business offered consists of small orders, on which immediate shipment is desired. The slow accumulation of tonnage during the past few weeks has enabled the Sheared Plate mill of the Illinois Steel Company to resume; it was started up on Monday with only enough specifications in sight to keep it going for a short time. The only irregularity in prices noted is the concession of $2 to $3 a ton, obtainable from a few sources on narrow Plates. We quote for mill shipment as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—While continuing more active than most of the heavier mill products, a normal demand for Sheets has not yet been approached. At the same time a moderately good tonnage is being booked and buyers are disposed to specify a little more freely. Both jobbers and mills report prices to be firm and unchanged. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 to 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c. Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No 30, 4.40c. to 4.45c.

Bars.—No business worth while is being offered and specifications are coming out very reluctantly. The various consuming interests are ordering only what is needed for actual consumption and do not anticipate their requirements. Only a small portion of the Bar mill capacity of this district is in operation this week. The entire situation, both as respects mills and consumers, is one of hand to mouth supply, but there is a hopeful feeling that more decided improvement will come with the development of spring work. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—Business for the month of March will register a slight increase in the aggregate over that of the preceding month. There is, however, no radical change in the situation; buyers continue to limit their purchases to the needs that develop from week to week. It is believed that with the opening of navigation, which will take place about April 15, there will be a better demand, especially from the Northwest. Store prices have stiffened up somewhat, and there is less disposition among jobbers to make extreme concessions on shipments from stock. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 71 per cent. on Black Steel Pipe, ¾ to 6 in. From two to 3 points above these prices is asked for Iron Pipe.

Boiler Tubes.—Until the tide of business brings an increased volume of new work to the Boiler shops there will be little quickening in the demand for Merchant Tubes. Only a moderate amount of business, consisting of scattered orders for immediate use, is being handled by either the mills

or jobbers. Rumors of price concessions made by some of the outside mills are heard, but nothing of importance in this respect is so far confirmed. Locomotive Tubes share the general inactivity noted in other Tubular goods. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2¾ to 5 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—The implement dealers are manifesting no interest in the market, and practically no new business is received from this source. A moderate demand for small Shapes and Machinery Steel is reported, and this is supplemented by a fair run of small orders for Tire stock from vehicle manufacturers. There is very little demand for Shafting, the regular discounts on which continue to be shaded. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent. less than car lots, base territory delivery.

Cast Iron Pipe.—The tonnage taken last week dwindled to a few small lettings of no particular importance, among which were 200 tons for Jackson, Mich., awarded to the Dimmick Pipe Company, and 200 tons let by Bay City, Mich. As far as can be ascertained, there is small prospect of any large tonnage requirements coming into the market in the immediate future. The eagerness of competition for what little business there is in sight has resulted in wide departures from the quoted prices. These on the whole are lower, and are herewith revised, but are at best only nominal. We, therefore, quote nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $28; 6 to 12 in., $27; 16-in. and up, $26, with $1 extra for Gas Pipe.

Old Material.—A recent purchase by a consumer, comprising about 2000 tons of Railroad Knuckles and Springs, is the only one of moment reported. This, it is understood, was taken for three months' delivery, on a basis of $11.25, Chicago. The rolling mills at their present rate of operation are not eating into their stock piles very rapidly, and replenishment orders from this source are, in consequence, light. Small lots of Cast Scrap are being taken here and there by the melters to meet current requirements, but no round lots for forward needs are included in these transactions. An offer of 1000 tons of Car Wheels was made this week by a prominent dealer at $14.50, without results. Due to the slack work in car shops, there is practically no demand for Wheels. It is understood that the 1000 tons of Iron Rails offered last week by the Chicago, Burlington & Quincy was disposed of to a manufacturer of Track Supplies under a trade exchange agreement. The Chicago & Northwestern is this week offering 650 tons of material. With the exception of Car Wheels prices are practically unchanged. We quote per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.00 to $15.50
Old Steel Rails, rerolling	12.00 to 12.50
Old Steel Rails, less than 3 ft.	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	20.50 to 21.50
Old Car Wheels	14.50 to 15.00
Heavy Melting Steel Scrap	11.25 to 12.00
Frogs, Switches and Guards, cut apart	11.50 to 12.00
Mixed Steel	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates	$13.50 to $14.00
Iron Car Axles	16.00 to 16.50
Steel Car Axles	14.75 to 15.25
No. 1 Railroad Wrought	11.00 to 11.50
No. 2 Railroad Wrought	10.00 to 10.50
Railway Springs	10.75 to 11.25
Locomotive Tires, smooth	14.00 to 14.50
No. 1 Dealers' Forge	9.00 to 9.50
Mixed Busheling	7.00 to 8.00
Iron Axle Turnings	6.00 to 6.50
Soft Steel Axle Turnings	6.00 to 6.50
Machine Shop Turnings	6.00 to 6.50
Cast Borings	4.75 to 5.25
Mixed Borings, &c	4.75 to 5.25
No. 1 Mill	7.00 to 7.50
No. 2 Mill	6.00 to 6.50
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	12.25 to 12.75
Stove Plate and Light Cast Scrap	10.25 to 10.75
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.50 to 10.00
Pipes and Flues	8.00 to 8.50

Metals.—In response to the upward tendency of Copper, a little stronger feeling has developed, but is not yet reflected in a decided betterment of demand. There are perhaps a few more orders coming out, but they continue to represent actual needs rather than prospective requirements. Other metals are somewhat firmer, but it cannot be said that a general forward movement is indicated by the present rate of consumption. We quote as follows: Casting Copper, 13¼c.; Lake, 13¾c. to 14c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 33c.; small lots, 31½c.; Lead, Desilverized, 4c. to 4.25c., for 50-ton lots; Corroding, 5.35c. to 5.45c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5.25c.; Cookson's Antimony, 12½c., and other grades, 10½c. to 11c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12½c.; Yellow Brass, 10¼c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

Pittsburgh.

PARK BUILDING, April 1, 1908.—(*By Telegraph.*)

Pig Iron.—Prices of Pig Iron seem to be lower at present than at any time since the decline in the market started, last October. Three or four furnaces that make Foundry and Malleable Bessemer are going out aggressively for business, and are naming low figures. Northern No. 2 Foundry is weak, at $15.50, Valley furnace, and on a firm offer and for desirable business this price could be shaded. Basic Iron is also quite weak, and can be had as low as $15.25, Valley furnace. There is practically no demand for Bessemer, the nominal market being $17, Valley furnace. Only very small lots of Pig Iron are being sold, consumers refusing to buy ahead in the present weak condition of the market. Northern Forge is also weaker, and we quote this at $14.75, Valley furnace, with a probability that even this low price might be shaded on a firm offer.

Steel.—There is some inquiry for Billets and Sheet and Tin Bars, especially the latter. The Steel mills that are now in operation are making heavier shipments than for some time. The Bessemer plants of the Republic and the Youngstown Sheet & Tube companies at Youngstown are both in full operation this week. We quote Bessemer Billets under the new arrangement put in force last week at $28, Pittsburgh; $28.50 Youngstown or Wheeling; and $28.75 for delivery in the Cleveland District. Sheet and Tin Bars are $29.50 and Forging Billets $30, Pittsburgh.

(*By Mail.*)

Conditions in the Steel trade are of an encouraging nature. While improvement is certain to be slow, yet it is believed the turn has been made and that there will be steady improvement from this time forward. The tonnage of new business entered by the mills in March and specifications against contracts in that month show an improvement over February, and it is believed April will bring a decided betterment over March. Good weather is an important factor in the situation, and now that spring has set in it is certain that the demand for a great many finished forms of Iron and Steel that are used in building construction and in other outside work will soon be larger. The chief trouble at the present time is the fact that the railroads are not buying, but as soon as they are able to negotiate loans which will give them money to make purchases of needed equipment, conditions in the Steel business are bound to show material improvement. It is stated that some of the railroads are so short of motive power that they are stripping engines now standing on side tracks and using part of the equipment in other locomotives that are being kept in active service. It is estimated that the railroads consume from 55 to 60 per cent. of the various forms of Iron and Steel, and with the railroad demand practically shut off for the last six months the reason for the present depression in the Steel trade can be readily seen. The Pig Iron market shows no betterment either in demand or prices, but early in April it is expected that a meeting of the Western furnace interests will be held in Cleveland to see if something cannot be done to improve the situation. There is a fair demand for Steel, and regular prices, in the main, are being observed. New business and specifications on contracts in Finished Iron and Steel are slowly increasing, the improvement having been most marked in the Tin Plate, Wire and Pipe trades. The Tin Plate trade is nearly back to what it was at this time last year, and the demand is increasing. The Coke trade continues very dull, and the same is true of Scrap, prices on the latter being weaker than for some time.

Ferromanganese.—New demand continues very dull, and with free offerings prices are weak and will likely be

lower. We quote 80 per cent. foreign Ferro at $43, seaboard, or $44.95, Pittsburgh.

Muck Bar.—The market is absolutely bare of sales, and we continue nominal quotations of $27 to $27.50, Pittsburgh, for best grades of Bar, made from all Pig Iron. Muck Bar made from part Scrap, can be bought at lower prices.

Rods.—There is a fair amount of inquiry for Rods, but no large tonnage is being sold, consumers buying only for actual needs. Bessemer Rods are held at $35, Open Hearth at $36, and Chain Rods at $37, Pittsburgh.

Skelp.—There is a fair amount of new inquiry, but the mills rolling Skelp are badly in need of orders, and it is probable that prices would be shaded on a firm offer. We quote nominally as follows: Grooved Steel Skelp, 1.60c.; Sheared Steel Skelp, 1.70c.; Grooved Iron Skelp, 1.80c., and Sheared Iron Skelp, 1.90c., f.o.b. Pittsburgh.

Steel Rails.—We note an active demand for Light Rails, specifications and new orders booked by the Carnegie Steel Company in the past week amounting to 2000 tons, among which was 500 tons for the Monongahela River Consolidated Coal & Coke Company. Very little new tonnage is being booked in Standard Sections, but negotiations with a number of the leading railroads have reached the point where it is believed it will be only a short time until they place orders. The Edgar Thomson Rail mills continue in operation, but have been "gaited" to about 30 per cent. of capacity. Prices on Light Rails are a little firmer, but mills that re-roll Rails are still cutting under from $2 to $3 a ton. We quote Light Rails as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—The outlook is not encouraging. It is true that locomotive builders have recently taken some work, but the Steel car builders have practically cleaned up all old orders and have little in sight, while the lake boat builders have practically no work ahead. The tonnage of Ore that will be brought down this season will be much less than in 1907, and this means that probably no large boats will be built this year. In the main regular prices on Plates are being observed, but occasional concessions of not more than $2 a ton, mostly on the narrow sizes, are made. We quote: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell grade of steel is abandoned.

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—A good deal of new work is coming up in the East, and also in Chicago and other Western points, but in the immediate Pittsburgh District very little is in sight. A new bank building at Connellsville, Pa., about 400 tons, and the extension to the Fort Pitt Hotel, about 1800 tons, are being figured on, but the latter job has not been financed as yet. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The aggregate new business placed with the mills in March showed an increase over February, but the Sheet trade is not as active at present as anticipated. It would be well to bear in mind that a material improvement in demand is likely to come at any time, and that large jobbers would be wise in carrying more liberal stocks than they are disposed to hold at present. Stocks all over the country are very low, and if a heavy demand should suddenly start there would be delay in filling orders from the mills, which have been running for some time to light capacity. The American Sheet & Tin Plate Company is operating this week 47 per cent. of its Sheet mill capacity, and next week will start up its Piqua, Ohio, plant, which contains four hot mills. As a rule, prices on Sheets are fairly well maintained, but occasional concessions are being made by a few mills. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—The demand is reported to be steadily increasing, and the American Sheet & Tin Plate Company recently started 12 of the hot mills in the American Works, at Elwood, Ind., and will start the other 16 hot mills next week. This company is now operating a total of 202 hot mills, or about 85 per cent., of its Tin mill capacity. The jobbing trade is still disposed to place orders only as actual needs require, and the low stocks on hand are shown from the fact that some recent orders for Tin Plate were sent in by telephone, with the request that spot shipment be made. The Tin Plate trade is peculiar in the fact that it does not depend to any extent on whether the railroads are buying or not, but as most of it is used in canning, there does not seem to be any good reason why this should not be a good year in the Tin Plate trade, providing we have average crops of fruits and vegetables. The fact is pointed out that jobbers would best serve their interests by placing orders more liberally, and having larger stocks of Tin Plate on which to draw when their demand sets in, which it is expected to do in the very near future. We are advised that prices are being maintained. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—The mills rolling Iron and Steel Bars continue to run intermittently, depending on current orders, which up to this time are not large enough to keep the mills running to more than 50 per cent. of their capacity, if that. The belief prevails to some extent that prices on Steel Bars may be readjusted to a lower basis before long, and for this reason the trade is buying conservatively, placing orders only for what may be actually needed. Specifications against contracts and new business entered in March show an increase over February, but conditions are still far from being satisfactory to the mills. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm at 1.60c., Pittsburgh.

Hoops and Bands.—Consumers are covered by contracts placed some time ago, against which they are specifying at only a fairly satisfactory rate, but there is no new buying. Regular prices are as follows: Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60c., base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Spelter.—Prices are very erratic, and, on the whole, are weaker. Prime grades of Western Spelter are now quoted at 4.50c., East St. Louis, equal to 4.62½c., Pittsburgh, but on a firm offer this price would likely be shaded. The demand is light, and the smelters are cutting down their output materially to keep down stocks as much as possible.

Railroad Spikes.—No large business has been placed since our last report, but several roads are in the market with inquiries for a fairly large tonnage, which may be placed before long. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carloads and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Merchant Steel.—We note a fair demand for season Steels, such as Toe Calk, Spring and Tire, but new orders are small and continue to represent actual needs of customers. The regular discount of 54 per cent. off on Shafting in carload lots continues to be shaded. We quote: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c. Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b., at mill.

Pipes and Tubes.—New business is showing a slow but steady increase, orders and specifications in March having been slightly larger than in February. The Youngstown Sheet & Tube Company has taken an order for about 11 miles of Galvanized Iron Pipe from 2½ to 6 in. in diameter, about 15 miles of Black Iron Pipe and about 9 miles of extra strong Wrought Iron Pipe for the Panama Canal, the total contract amounting to $45,628. It is understood that considerable tonnage in Steel Pipe is yet to be placed by the Canal Commission. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list.

while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black. %	Galv. %
⅛ to ¼ in.	65	49
⅜ in.	67	53
½ in.	69	57
¾ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
⅛ to ⅜ in.	58	46
½ to 4 in.	65	53
4½ to 8 in.	61	49
Double extra strong, plain ends:		
½ to 8 in.	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black. %	Galv. %
⅛ and ¼ in.	63	..
⅜ in.	65	51
½ in.	67	55
¾ to 6 in.	71	61
7 to 12 in.	68	53
Extra strong, plain ends:		
⅛ to ⅜ in.	56	44
½ to 4 in.	63	51
4½ to 8 in.	59	47
Double extra strong, plain ends:		
½ to 8 in.	52	41

Boiler Tubes.—No large contracts have been placed since our last report, but some business in Locomotive Tubes is pending, which is expected to be given out in a short time. We are advised that prices are being fairly well maintained. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	42	47
1¾ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 5 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Coke.—There is practically no new demand for either Furnace or Foundry Coke and prices continue weak. Furnace Coke made in the Klondike and Latrobe districts continues to be freely offered at $1.60 to $1.65, at oven, for prompt shipment, while other grades of Coke, not so high in quality, are offered at lower prices. Best grades of 72-hr. Foundry Coke are held at about $2.25, at oven, to consumers, but Main Line grades are offered at $2 to $2.10. The output of Coke in the Upper and Lower Connellsville regions last week was 160,085 tons, which is only about 40 per cent. of capacity of these two regions.

Iron and Steel Scrap.—Not enough is being sold to test the market, consumers limiting their purchases to small lots for actual needs. Not much improvement in demand is expected until finishing mills are able to get more orders and operate their mills to larger capacity than they are doing now. Prices are weak, and on a firm offer it is probable that the quotations named below would be shaded. Dealers quote about as follows: Heavy Steel Scrap, $13 to $13.25; No. 1 Railroad Wrought Scrap, $14 to $14.25; No. 1 Cast Scrap, $15 to $15.25; Bundled Sheet Scrap, $10 to $10.25; Cast Iron Borings, $7.75 to $8; No. 1 Busheling Scrap, $13 to $13.25; No. 2, $10.25 to $10.50; Steel Axles, $16.50 to $17; Sheet Bar Crop Ends, $17 to $17.25; Low Phosphorus Melting Stock, $17.25 to $17.50; Iron Axles, $20 to $20.50; Machine Shop Turnings, $8.75 to $9; Rerolling Rails, $14.25 to $14.50; Old Steel Rails, short pieces for Open Hearth use, $13 to $13.25; Grate Bars, $13.25 to $13.50.

Birmingham.

BIRMINGHAM, ALA., March 30, 1908.

Pig Iron.—Melters have found it necessary to negotiate for additional tonnage, and the aggregate of sales is considerably in excess of those reported last week. Some inquiries are pending and the market shows additional strength. Purchasers are still disposed to pursue a conservative course as to engagements, but proportions of requirements have increased perceptibly. The manufacturers of Cast Iron Pipe are consuming more tonnage, and shipping orders from all sources indicate an increase in their melt. An improvement is also noted in the demand for Basic Iron, the sales consummated during the week reaching fair proportions. The recent decisions favoring railroad companies are not without a salutary effect, and in view of the developments in monetary affairs a general improvement in sentiment is noted. Despite the fact that frequent sales are reported at figures below the established price of $13, Birmingham, leading interests are adhering to such a basis without manifesting a disposition to make concessions. A reported sale of 1000 tons at $13 is not confirmed, but a number of lots ranging from one carload to 100 tons have brought that price, while the principal sale reported for the week was a lot of 2000 tons at $12.75, Birmingham. However, a lot of 250 tons of No. 2 Foundry was sold for $12.50, and there is evidence of a disposition to make a greater differential than 50c. per ton on a No. 2 basis for lower grades. With the coming of the second quarter two additional furnaces will be put in blast, which will increase the active capacity to 20 stacks. The completion of the new Vanderbilt Furnace of the Birmingham Coal & Iron Company and the remodeling of the Woodstock Iron & Steel Corporation's idle furnace at Anniston, Ala., will increase the available capacity two stacks.

Cast Iron Pipe.—Among the contracts placed with Southern plants during the week the following are most significant: Milwaukee, Wis., 3800 tons; Meridian, Miss., 1000 tons; approximately 1000 tons for the Kansas City Southern Railway; 600 tons for Savannah, Ga. The contract for Memphis, Tenn., has also been awarded, but the tonnage cannot be ascertained. It is to be noted that the American Cast Iron Pipe Company is making frequent shipments of Water Pipe to Alaska. This is probably the first material of the kind that has been furnished that territory by the South in a number of years. No new lettings are advertised, but the recent sale of bonds is encouraging and an optimistic feeling prevails. Sharp competition continues to result in low prices on large contracts, but for comparatively small lots quotations are firmer. We quote nominally as follows for Water Pipe per net ton, f.o.b. cars here: 4 to 6 in., $27; 8 to 12 in., $25; over 12-in., average $24, with $1 per ton extra for Gas Pipe.

Old Material.—As noted in the Pig Iron market, sentiment has improved, but the volume of business has not increased in proportion. Transactions continue on the hand-to-mouth order, with dealers and producers apparently most interested in bargain lots. An occasional sale is made of high grades, but the demand is chiefly for Cast Scrap and Stove Plate, which is being met with prices considerably at variance. We continue to quote nominally the following per gross ton, f.o.b. cars here:

Old Iron Rails	$16.50 to $17.00
Old Iron Axles	15.50 to 16.00
Old Steel Axles	14.50 to 15.00
No. 1 Railroad Wrought	13.00 to 13.50
No. 2 Railroad Wrought	10.00 to 10.50
No. 1 Country Wrought	11.50 to 12.00
No. 2 Country Wrought	9.50 to 10.00
Wrought Pipe and Flues	10.00 to 10.50
No. 1 Steel	11.50 to 12.00
No. 1 Machinery	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.00 to 6.50

Cleveland.

CLEVELAND, OHIO, March 31, 1908.

Iron Ore.—One merchant Ore firm has received some inquiries from furnace interests during the past few days asking what it will have to offer this season in the way of Old Range Bessemer; but the communications were not regarded as actual inquiries for Ore. Although orders for shipment of Ore from the docks to the furnaces have improved since the first of the month, the improvement from week to week is very slight. While some Ore firms are making a considerably better showing, one of the largest Ore companies reports that its shipments at the present time are not over 10 per cent. as large as at this time a year ago. The Ore stock piles of some furnaces that have been in blast the greater part of the winter are said to be getting nearly cleaned up, so that it is believed there will be a considerable increase in shipping orders during April. There are many furnaces, however, that have enough Ore on their stock piles to last them until this season's shipments from the mines begin, and these will be in no hurry to move their Ore from the docks. The leading interests seem determined to adhere to their plan not to start their Ore shipments before June 1, and vessel interests in general are preparing for a late opening of navigation. Vessel tonnage is being offered for Ore, but no chartering is being done, and it is not expected that any will be done until the Ore is sold. The question of lake rates has not yet been taken up by the vessel owners. At a meeting of the Lake Carriers' Association held in this city last week the vesselmen present expressed thmselves in favor of an open shop on the lake boats. There is no disposition to cut wages, but the boat owners want to do away with dictation in the handling of their property. Vesselmen generally are willing to pay last season's scale of wages, but they feel that all agreements in regard to working conditions and duties of the men aboard the boats should be eliminated. No action was taken, but the matter will be further discussed at a meeting of the Board of Directors, to be held April 9. We quote Ore prices at Lake Erie docks, for 1908 delivery, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.20; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—The only sales of Foundry Iron reported in this territory during the week are a few car lots and one or two 100-ton lots. While the price schedule adopted at the Cleveland conference of furnace interests a few weeks ago

is being maintained by the leading producers and the two local furnaces, plenty of Iron is being offered by furnaces that are willing to make sales at about $15.50, at furnace, for No. 2 Foundry. Local consumers have been offered No. 2 Foundry Iron at $16.40, delivered, or $15.50, Valley furnace, the local delivered price under the schedule being $17.35. While one or two furnace interests report some increase in shipping orders, the improvement is slight and the general condition of the foundry trade in this territory does not indicate that there will be much if any increase in the demand for Foundry Iron in the near future. We note the sale of 100 tons of Off Malleable Iron by a local interest at $16, Valley furnace. A local interest operating furnaces in Buffalo and Pittsburgh territories reports some improvement in the Eastern demand for Foundry Iron. This interest reports sales of 1000 tons of No. 2 Foundry Iron at western Pennsylvania furnace at prices ranging from $16.50 to $16.75, Pittsburgh, and 3000 tons at western New York furnace at prices ranging from $16 to $16.50, at furnace. The sales were made in lots ranging from carloads to 500 tons for spot and second quarter delivery. Buffalo Union furnace A of M. A. Hanna & Co. has gone out of blast as the result of a hot spot, and will have to be relined. As a result of the shutdown furnace B will probably be put in blast in about 10 days. No sales of Southern Iron are reported, and there are no inquiries for Basic Iron. For prompt shipment and for the second quarter we quote, delivered, Cleveland, as follows:

Bessemer	$17.90
Northern Foundry, No. 1	$17.00 to 17.85
Northern Foundry, No. 2	16.50 to 17.35
Northern Foundry, No. 3	16.00 to 16.85
Southern Foundry, No. 2	16.35 to 16.85
Gray Forge	15.90 to 16.40

Coke.—There is practically no demand for either Furnace or Foundry Coke. Prices remain about stationary. We quote Connellsville Furnace Coke at $1.60 to $1.80, at oven, for spot shipment, and Connellsville 72-hr. Foundry Coke at $2.25 to $2.40, at oven, although some interests are holding for $2.50.

Finished Iron and Steel.—Conditions in this line show little, if any, improvement, although there are some reports of a slight improvement in specifications. The principal activity has been in Structural Material and Light Rails. One mill received specifications for several hundred tons of material, mostly Structural, from a local bridge builder, and another local fabricator placed an order for 350 tons. Stocks in some of the local Structural shops have become depleted. While there is no work in sight requiring a large tonnage of Structural Material, municipalities and counties in this territory are planning considerable bridge work for the coming season. The only building for which a fair tonnage will be needed soon is the First National Bank Building in Youngstown. The amount required has not yet been announced. An order was placed during the week with the Lorain Steel Company for 1200 tons of girder Rails, to be used in rebuilding two street car lines in this city, that were torn up a year ago during the local street railroad war. Quick delivery is wanted. During the week two contracts were closed by Coal mining companies, one for 175 tons of Light Rails for delivery during the balance of the year, and the other for 400 tons. Orders for several car lots were also placed. The sales were made below the regular price quotations, but at better prices than the mills have been compelled to make recently in competition with the mills rerolling Rails. A careful canvass of this territory shows that it is very improbable that any considerable tonnage of Rails will be bought for interurban traction lines the coming season. The general demand for Finished Material from consumers shows little change, and the few current orders are for small lots. Local warehouses report that their stock sales for March will be but slightly larger than during February. The demand for Iron and Steel Bars is light, being nearly all on contracts. Local Bar Iron mills continue to run about half time. Iron Bars, on which the price was shaded for several weeks, are firmer, as the result of the action of the Western Bar Iron Association in reaffirming prices last week, and the established price is now being maintained. The demand for Plates is light, and smaller mills are still making price concessions of $2 a ton. Sheet prices are weak, and there is practically no demand. We quote Iron Bars at 1.60c., Cleveland, for car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., Cleveland. We quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. The store price on Steel Bars is 1.75c. to 1.85c., and on Iron Bars, 1.75c. to 1.80c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—There is no improvement in the demand, and the market shows a tendency to further weakness. In the absence of any demand Old Car Wheels are quoted $2 a ton lower than last week, and quotations about 50c. a ton lower are being made on Railroad Wrought and Cast Scrap. Dealers say that they cannot buy Scrap at prices low enough to sell to consumers at the prices the latter are now offering. The railroad offerings this week include some tonnage to be sold by the Erie Railroad and about 1000 tons to be sold by the Pennsylvania Lines, West. Dealers' prices to the trade are as follows, per gross ton, f.o.b. Cleveland:

Old Steel Rails	$11.00 to $11.50
Old Iron Rails	15.00 to 16.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	13.00 to 13.50
Relaying Rails, 50 lb. and over	21.00 to 22.00
Heavy Melting Steel	11.00 to 11.50
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	7.00 to 8.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	10.50 to 11.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 1 Cast	12.00 to 12.50
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	8.00 to 9.00

Philadelphia.

PHILADELPHIA, PA., March 31, 1908.

A slight improvement was to be noted in the number of orders taken in several branches of the trade the past week, but there has been no appreciable gain in the tonnage output of the various mills. It seems hard to get above the 50 per cent. basis, at which plants have been running for some months. Here and there a temporary gain will be made, but usually it has been impossible to keep running very long at the increased rate of production. That there is more business floating around there is no doubt, but prospective buyers do not seem to be inclined to place the business, preferring, it seems, to wait a little longer before actually giving out their orders. Some railroad business has come out. The Lehigh & New England Railroad, controlled by the Lehigh Coal & Navigation Company, placed an order last week for 250 Steel gondola cars of 80,000 tons capacity with the Cambria Steel Company, and another for 250 Steel framed box cars of 60,000 tons capacity with the American Car & Foundry Company. Cast Iron Pipe makers report orders more numerous, several pretty fair sized orders for Pipe having been recently booked, while the aggregate tonnage of miscellaneous orders is said to be larger than has been the case for some time. The feeling in the trade generally is a shade more hopeful, and it is believed that a fair share of the business which has been withheld for so long will come out in the near future.

Pig Iron.—Little change is to be noted in the demand. In some instances sellers report increased sales, while others report buying to have been lighter. The aggregate tonnage taken is not large, although there is a disposition shown by some buyers to protect themselves more fully against their requirements for the second quarter and in a few cases part of the third quarter. The same hesitancy continues to be shown in most cases, however, in placing orders for anything much beyond immediate requirements. The Cast Iron Pipe interests have been the most active, and some of the local makers have been buying both standard and off grades of Iron in small quantities. No large tonnages have been sold, although there is now an inquiry in the market for 4000 tons for early delivery. Prices continue unsettled, but the leading Eastern furnaces maintain their established prices on the basis of $18.25, delivered, for No. 2 X Foundry. Sales of this grade have been made in lots ranging from carloads up to several hundred tons, and some lots of No. 2 Plain have also been sold at the established basis. There seems to be no weakening by those in the agreement as far as price is concerned, and in a number of instances producers say they will curtail production rather than reduce the price. Outside interests, however, continue their lower quotations, which range about 50c. below those agreed on by the leading interests, so that No. 2 X Foundry can be had to-day at prices ranging from $17.75 to $18.25, delivered, and a large share of the business, under these conditions, is going to the independent furnaces. Sales of Virginia Irons have again developed a little irregularity; some interests have sold quite heavily, while others have done but little business. Most of the sales have been in small tonnages, but in one instance a 1000-ton lot of No. 2 X for Western delivery was sold, the price being $14.50, at furnace. Prices for delivery in this territory range at about $17.75 for No. 2 X and $17.25 for No. 2 Plain, although some makers would no doubt take 25c. a ton less on fair sized tonnages. Sales of Southern Irons have been reported rather light the past week, although there is some figuring now being done on several good sized tonnages. Forge Iron has not been in active demand. Sales of small lots by both inside and outside interests have been made, but there are no large tonnages on the market. Prices

range from $16.25, at which sales have been made by the independent furnaces, to $16.75, the price maintained by those in the agreement. Steel making Irons are uncalled for, and what inquiries there were on the market a few weeks ago for Low Phosphorus Iron have been withdrawn. Prices show no change, the inside figures in the tabulated prices below (with the exception of Low Phosphorus Iron) being those at which business has been done by the independent furnaces, while the outside figures represent the agreed prices of the Eastern makers for delivery in buyers' yards, eastern Pennsylvania, and adjoining territory during the second quarter:

No. 2 X Foundry	$17.75 to $18.25
No. 2 Plain	17.25 to 17.75
Gray Forge	16.25 to 16.75
Basic	17.25
Low Phosphorus	23.50 to 24.00

Ferromanganese.—The demand for Ferro has again quieted down, and such business as is coming out is confined to broken lots, for prompt shipment. The inquiry for 1000 tons before the trade early last week was closed at a price close to $42.50, seaboard, and 200 tons of Ferrosilicon was sold to the same buyer at approximately $80, seaboard. Prices for 80 per cent. Ferromanganese are a little easier, $42.50 to $43.50, Baltimore, being named for early shipment.

Steel.—The adjustment of the delivered prices in Steel Billets, Sheet Bars, and Blooms, by the absorption on the part of the mills of half of the freight charges, within certain limitations, has stimulated the demand in this territory to some extent. One mill has booked a very satisfactory order for Billets on the new basis, while there has been an increased number of small orders. Production continues, however, at about the same rate, the total volume of business not yet being sufficient to increase the output to any appreciable extent. We quote, for delivery in Philadelphia and vicinity, $29.20 for ordinary Rolling Billets, and $31.20 for Forging Billets, with the usual extras for high carbons and large sizes.

Plates.—A little more business has developed. There has been more inquiry from several sources, and Plate makers are more hopeful as to future business. One consumer is in the market for several thousand tons of Tank Plates, while another has placed an order for 2000 tons, for Steel Pipe work, for delivery next month. Orders for several other moderate sized tonnages have also been booked. Production meanwhile continues on a fairly even basis, and prices are being fully maintained, quotations for delivery in this territory being as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—The amount of business coming out is not large. Spring building operations develop slowly, although several fair sized propositions are being figured on. The new pavilion of the Athletic Baseball Club will require some 800 tons of Structural Material, while a new opera house, to be built during the summer, will require, it is thought, even a larger tonnage. The greater proportion of the business booked recently has been of a miscellaneous character, but with the amount of new work in sight it is believed there will be an improvement in the demand before a great while. Quotations are being firmly maintained, 1.85c. to 2c. being named, according to specification.

Sheets.—Inquiry for Sheets has been decidedly better, and buyers show a disposition to consider larger tonnages, which would indicate an improvement in the near future. Orders, however, are not developing rapidly at the time, and mills do not show any gain in production. Prices are unchanged, the following range being quoted for mill shipments, with a tenth extra for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—New business is extremely quiet, while specifications on old orders come out but slowly. Mills, therefore, do not gain in tonnage and are running irregularly. Some consumers are not inclined to pay the present basis of 1.65c., delivered in this territory, for Refined Iron Bars, and there are rumors that their counter offers of 1.55c. are being met either directly or on conversion deals. The leading mills, however, are maintaining the established price.

Old Material.—The market is extremely quiet and the demand has fallen off to almost nothing. Mills show no interest in the market. Prices are not considered very strong, but in the absence of business there is no quotable change. We quote nominally as follows, for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory:

No. 1 Steel Scrap and Crops	$12.75 to $13.25
Low Phosphorus	17.50 to 18.00
Old Steel Axles	17.50 to 18.00
Old Iron Axles	20.00 to 21.00
Old Iron Rails	17.00 to 18.00
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	9.00 to 9.50
Stove Plate	11.00 to 11.50
Cast Borings	7.50 to 8.00
Grate Bars	11.75 to 12.25

Coke.—The demand for Coke has again become inactive. Sales of small tonnages are reported, but there is little business of any size around. What business has been done was at the lower range of prices, which for Foundry Coke are $2.25 to $2.50 at oven, with Furnace Coke at from $1.75 to $2 at oven. For delivery in the Philadelphia territory we quote the following range of prices:

Connellsville Furnace Coke	$4.00 to $4.25
Foundry Coke	4.45 to 4.70
Mountain Furnace Coke	3.60 to 3.85
Foundry Coke	4.10 to 4.35

Matthew Addy & Co., whose local office is in the Real Estate Trust Building, Philadelphia, Pa., have been appointed sole sale agents in America for the Pyle & Blaina Works, Ltd., Monmouthshire, England, manufacturer of 80 per cent. Ferromanganese and Spiegeleisen.

Cincinnati.

CINCINNATI, OHIO, April 1, 1908.—(*By Telegraph.*)

The passing of March shows scarcely the expected improvement in the Iron and Steel trades in turning the first quarter, although at the offices of the Pig Iron sales agents the accumulation of the last few days' inquiries suggests better things for April's debut. Evidences are plenty that the buying mood is on, both of crude and finished product, but sales are restricted in the matter of volume and quantity, for the hand to mouth system rules absolutely. Some of the jobbing foundries are coming in the market for small needs, and a few of the machinery concerns are putting out salesmen who have been idle thus far in the year. A call sent to all members of the Iron Buyers' Association asks attendance at a meeting to be held on Thursday, April 2, at the Phillips House, Dayton, Ohio. This meeting is a very important one, inasmuch as the proposed uniform contract submitted to furnaces and selling agents late last year will be up for adoption. If it is passed as drafted furnaces will have to make several changes in their individual contracts, and the Traffic Committee hopes to effect a change also in the prevailing tariffs from the Birmingham District. In the Scrap market great dullness prevails, and scarcely any line may be said to be in even moderate demand.

Pig Iron.—The second and third weeks of March were not duplicated in the flight of the last one, and sales of Pig Iron have gone off in this market until one hears of little but hurry orders of a carload or so for immediate use. Most of the tonnage now going is of this character or on contract. Conservative dealers say that the business is all that could be expected, and that a fair volume may be expected ere the close of the second quarter. Among the few inquiries heard is one for 4000 or 5000 tons for an Eastern Pipe shop for April and May delivery and a 100-ton requirement of Malleable Bessemer from a northern Ohio melter. The Indiana inquiry mentioned last week of 700 tons of High Silicon is expected to be closed to-morrow. A local stove founder has purchased some Northern Foundry Iron analyzing No. 2 at a price said to be near $15.50 at furnace. A Detroit melter is in the market for some Foundry Iron for immediate needs, and a small lot of high Manganese Iron is wanted by an Ohio melter. While most dealers are asking $12.50 and $13, Birmingham, for Southern No. 2, it is pretty well established that purchases are being made freely at $12, Birmingham. There are a number of offers in hands of agents from buyers which have been turned down by the furnaces, among them one of $10 at furnace on some Forge Iron. The price of $19 at furnace on 8 per cent. Silicon Northern is apparently being well maintained. It is reported here that the new furnace in the Jackson County District will be blown in soon. On forward deliveries extending beyond the first half one hears nothing better than $13, Birmingham, on Southern No. 2, and few of the furnaces are willing to do that. Gadsden Furnace of the Alabama Consolidated, which has been out since December, is going in blast within the next week or so. Victoria Furnace of the Goshen Iron Company was blown in March 25. It was blown out in early December. The capacity is 125 to 150 tons a day, and the output is sold exclusively by Rogers, Brown & Co. There are now but four furnaces in blast in the Ironton District. We

quote for immediate delivery and for balance of first half. f.o.b. Cincinnati, as follows, the freight rates being $3.25, $1.80 and $1.20 from the Birmingham, Valley and Hanging Rock districts, respectively:

Southern Coke, No. 1	$15.75 to $16.25
Southern Coke, No. 2	15.25 to 15.75
Southern Coke, No. 3	14.75 to 15.25
Southern Coke, No. 4	14.25 to 14.75
Southern Coke, No. 1 Soft	15.75 to 16.25
Southern Coke, No. 2 Soft	15.25 to 15.75
Southern Coke, Gray Forge	13.75 to 14.25
Southern Coke, Mottled	13.25 to 13.75
Ohio Silvery, 8 per cent. Silicon	20.20 to 20.70
Lake Superior Coke, No. 1	17.70 to 18.20
Lake Superior Coke, No. 2	17.20 to 17.70
Lake Superior Coke, No. 3	16.70 to 17.20
Standard Southern Car Wheel	23.75 to 24.25
Lake Superior Car Wheel	22.50 to 23.00

(By Mail.)

Coke.—Business, such as it is, is satisfactory in character to dealers, if not altogether in volume. In the matter of volume, however, close observers of the situation are inclined to regard the last two weeks as about the quietest and least productive of the year so far. Word from the Connellsville and Pocahontas districts indicates that more ovens have been put out. There is practically no Furnace Coke moving; there are some Foundry grades selling, however, and the indications are that jobbing foundries all over are fixing to come into the market soon for requirements. The report that one of the large lathe manufacturers has just contracted for 800 tons of castings interests local jobbing interests and Coke sellers. Connellsville Foundry, choice grades, is quotable at $2.25 to $2.50; Pocahontas, $2 to $2.25; New River, $2.75 to $3; Wise County, $2.25, all at oven. Connellsville Furnace grades are $1.70 to $1.90; Pocahontas, $1.75 to $1.90; New River, $2.40 to $2.60; Wise County, $1.75 to $2, all at oven.

Finished Iron and Steel.—Jobbers and small dealers note a trifle better inquiry for staple lines, and there is a little movement on Plates and some interest manifested in Structural Material. The mills are vigorously campaigning for specifications. Rumors of cutting on Iron Bars in another part of this territory are attributed to a special desire at this time to move surplus stocks, anticipating some further reducions from the mills. Stores here are maintaining prices firmly, and there are no changes to be noted. Collections are a little easier, and the end of the month will show a better balance in this regard. Dealers quote f.o.b. cars Cincinnati, as follows: Iron Bars, carload lots, 1.65c., with half extras; small lots from store, 1.85c., base, half extras. Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2.10c. Blue Annealed Sheets (heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c.; No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.25c. No. 12, carload lots, 2c.; small lots from store, 2.35c. Sheets (light) Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c., base. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.

Old Material.—Practically nothing is doing in the Scrap market, and it is very difficult to get figures upon which to base prices. The larger dealers, however, for the first time this year are not talking lower levels, and for the most part believe that bottom has about been reached. The mills are not buying, and very little trading is going on between dealers. As nearly as it can be estimated, the local market is about as follows, prices being f.o.b. cars Cincinnati:

No. 1 Railroad Wrought, net ton	$11.00 to $11.50
Cast Borings, net ton	4.50 to 5.00
Heavy Melting Steel Scrap	11.00 to 11.50
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	15.00 to 16.00
Old Iron Rails, gross ton	14.00 to 15.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	20.00 to 21.00
Old Car Wheels, gross ton	13.00 to 14.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

The Domhoff & Joyce Company, Cincinnati, has been appointed sole agent for the Central West territory for the Sloss-Sheffield Steel & Iron Company, succeeding Robert Field, resigned. This agency has retained the services of Mr. Field, who will be given charge of select territory. The change and appointment are effective April 1. J. C. Layne, Jr., formerly with the Robert Field Company, Cincinnati, as salesman, is now with Eaton, Rhodes & Co., Cincinnati, the appointment effective April 1.

Buckner Wallingford, Jr., of the firm of Wallingford & Co., Cincinnati, is now in charge of the Pittsburgh office, which has moved from the Farmers' Bank Building, in that city, to 601 People's Building.

San Francisco.

SAN FRANCISCO, CAL., March 25, 1908.

There has been some improvement in the Iron and Steel trade in the past two weeks, although the scarcity of money for carrying out new enterprises is still very marked. The continued fine weather has been very favorable for building construction. Not as much new work has been initiated in the building line as during the first three months of last year, but it is estimated that $50,000,000 worth of construction work is now in progress. In the aggregate quite a lot of Steel bridge work will be done in California in the present year, but no large contracts have been closed recently. The announcement this week by Charles M. Schwab that, owing to the favorable manufacturing results of the past year, at least $600,000 will be expended in betterments at the Union Iron Works in this city, has had a good effect. No Government construction contracts are being filled at the company's yards at present, and most of the new work on merchant vessels is finished. The plant is getting its share of the marine repair work of the port, however, and the outlook is good for heavy mining machinery. There are more inquiries and collections are somewhat better.

Structural Material.—Shipments of Steel for several new buildings are coming through from the East in very good time, as the railroads now have plenty of empty cars. A number of Steel frames have been completed in the past month, and comparatively few crews are now engaged in erecting Steel.

Cast Iron Pipe.—The immediate demand for Cast Iron Pipe is light, but there are a number of small lots in sight, contingent, in some cases, upon the voting and successful placing of municipal bonds. The Town Trustees of Redwood City, Cal., have called for bids for 2000 ft. of 4-in. Pipe, with hydrants, &c. It is proposed to hold a bond election in Madera, Cal., in April for the purpose of securing a water works system. Yuba City, Cal., is negotiating for a system of fire protection. Prices of Cast Iron Pipe are about as follows, per net ton, f.o.b. Pacific Coast terminal points: 4-in., $39; 6, 8, 10, and 12-in., $38.

Merchant Pipe.—Stocks in jobbers' hands are rather small, and comparatively few orders are being placed. Bids will be opened by the Board of County Commissioners of Humboldt County, Nev., April 7, for 6500 ft. of 4-in. Casing Pipe; 100 ft. of 6-in. Casing Pipe; two 6-in. Hub End Gate Valves, and nine anti-freezing National 4-in. double nozzle hydrants, to fit 2½ in. fire hose. Discounts on Steel Pipe are about as follows, on jobbers' carloads:

	Steel. Black.	Steel. Galv.
	%	%
⅛ to ¼ in	58.5	42.5
⅜ in	60.5	46.5
½ in	62.5	50.5
¾ to 6 in	66.5	56.5
7 to 12 in	63.5	48.5
Extra strong, plain ends:		
⅛ to ⅜ in	51.5	39.5
½ to 4 in	58.5	46.5
4½ to 8 in	54.5	42.5
Double extra strong, plain ends:		
½ to 8 in	47.5	36.5

Pig Iron.—Dullness is still the predominating feature in the local market. Very little has been added to the ample stocks on hand by new shipments from Europe via Cape Horn, and no Chinese Pig Iron has arrived recently. The Heroult Electric Iron & Steel Company is still experimenting with its electric furnace at Heroult, Shasta County, Cal., in the hope of finally producing a satisfactory commercial Pig Iron. Plenty of heat can be secured by the use of electric power, but it may take some time to find the proper mixture of ores and treatment to make a grade of Iron that will meet requirements. No. 1 Scotch Pig Iron and No. 1 English Pig Iron are quoted in this market at about $28 to $29 per ton, ex yard.

Coke.—A slight improvement is noted in the demand for Coke, especially in the cheaper grades used for smelting in the mining districts and elsewhere. Receipts of Coke at this port by sea have been extremely light for a month. Prices are unchanged. Stocks are sufficient for present needs, but the starting up of several smelters will improve the demand.

Railroad Supplies.—Great stagnation still prevails in nearly every department of Railroad Supplies. Several new railroad projects are being promoted, but the money to purchase materials and equipment is not yet available. Dealers in supplies are living in hope of an improvement in railroad finances within a few months. A few Spikes and sundries are being purchased, but no large orders for Rails are being closed. The Arthur Koppel Company was the lowest bidder on a requisition for 1200 ft. of 20-lb. portable Railroad Track and several platform cars for the Mare Island Navy Yard at Vallejo, Cal.

The Board of Public Works of Oakland, Cal., has received bids for the pumping machinery to be used at Lake Merritt for an auxiliary salt water pumping station, as follows: Oliver Engineering Company, $22,745; Corliss Engine

Company, $36,600; Joshua Hendy Iron Works, $39,475; Union Gas Engine Company, $45,000; Fairbanks, Morse & Co., $27,990; Atlas Gas Engine Company, $39,750; Doak Gas Engine Company, $28,971; United Iron Works, $35,000. The specifications provide that the gas engine driven pumps shall supply 2000 gal. of water per minute against a working head of 200 lb. per square inch.

Advices from Estancia, N. M., say that a representative of the Standard Oil Company has closed a deal for property contiguous to the Sante Fe tracks at Willard, on which the company will erect three very large Steel tanks for the storage of oil.

Holbrook, Merrill & Stetson, San Francisco, have been awarded a contract for 25,000 ft. of 1-in. Black Iron Screw Pipe at 4.8c. per foot, for use in connection with the new Owens River aqueduct, by the Los Angeles Board of Public Works.

Two English engineers, H. B. Alexander and J. B. Lyndon, have submitted ideas for a city incinerating system for garbage to the local Health Board. It is proposed to install four plants, which will also utilize ashes and clinkers and generate electric power.

The new experimental electrical furnace, at Heroult, Cal., has been in continuous operation for some days. Twenty-four hundred pounds of Pig Iron have been produced daily, and the furnace is tapped every six hours. This new furnace is an invention of Professor Lyon of Stanford University, who has superintended its construction and is directing its operation. The plant for the manufacture of carbon electrodes of very large size for use in the furnace is nearing completion, as is the plant for obtaining by-products of wood incident to the manufacture of charcoal and carbons.

The Coal Trade.

BY F. E. SAWARD, NEW YORK.

The mining companies in Illinois, Indiana, Ohio and western Pennsylvania would welcome a full month's suspension of output, so as to have a livelier tone to trade for the remainder of the year. Under the possibility of labor troubles Coal shipments have been showing a material increase, but nothing like what many expected. Manufacturers, railroads and general consumers have been accumulating Coal, but they have evidently been studying the statistical position and realize that there is much more Coal above ground than is needed for some weeks, and that if a strike should come it would not prove very embarrassing to anybody. The central Pennsylvania District has made, by the convention of operators' and of miners' representatives, a renewal of last year's wages basis for the term of one year. Judged from this, one may expect similar action in other districts. Prices in open market, therefore, will not be any less than those heretofore quoted.

New River and Pocahontas people have made their opening prices 10c. less than last year, and consequently figures quoted for cargo and contract business are on the basis of $2.65 at Norfolk and Newport News for shipments to September 1, and $2.75 for shipments after that date. This will certainly make hard sledding for Pennsylvania operators, more particularly where they compete for tidewater business. It is true that these operators have a distinctive and exclusive territory so far as New River and Pocahontas competition is concerned in Connecticut, western Massachusetts, New Hampshire and Vermont, which is more particularly all rail territory, but they certainly will lose some tidewater business in New England, which will be "competitive."

New York shippers are reportiug that the Coal situation shows a little more improvement. The operators are still holding down the production, and prices are about the same. Quite a number of contracts are being closed for the coming year, although not so many as were closed during the same period last year. The contract prices, as nearly as can be ascertained at the present time, will be on abount the same basis as last year, although some time ago it looked as though they would be a little lower. No doubt some of the cheaper grades of Coals will be closed this year at lower prices, but Coal bearing a reputation will command as good a price as last year.

The Anthracite business is practically at a standstill so far as new orders are concerned, on account of the reduced prices on April 1. Consumers are merely buying in sufficient quantities to keep them going. Contract prices seem to be about the same as last year, with the exception of Pea Coal, which will be advanced 25c. per ton. Anthracite at tidewater, per gross ton, is quoted as below:

	Lehigh.	Free-Burning.
Pea	$3.00 to $3.20	$3.00 to $3.25
Buckwheat	2.35 to 2.50	2.45 to 2.75
Rice or No. 2 Buck	1.70 to 1.75	1.75 to 2.00

Individual and Washery Pea, $2.85 to $3.00; Washery Buckwheat, $2.40 to $2.50; Washery Rice, $1.65 to $2.00; Barley, $1.45 to $1.50.

The April prices of the several domestic sizes of Anthracite are put on the usual schedule—a reduction of 50c. a ton, but the steam sizes seem to be well held, for the present at least.

A feature of the closing Coal year was the largely increased demand for Steam Coal. Pea Coal was sold at a premium in nearly every month, while other small sizes were scarce and more profitable. Within a short time Pea Coal will no doubt command a permanently higher price. It is quite as valuable as Chestnut Coal from all points of view as domestic fuel, and the public is fast discovering the fact.

Bituminous at tidewater, per gross ton, is quoted as follows:

Georges Creek	$3.25
High-grade, three-quarter lump	3.25
High-grade, Gas, run-of-mine	3.15
Best Miller, vein coals	2.95
Good Miller and Moshannon	2.65
Best Somerset	2.70
Ordinary Somerset	2.60
Fairmont, three-quarter	2.95
Fairmont, run-of-mine	2.65
Odds and ends	2.25 to 2.45

Prices on Bituminous at the mines per net ton, prompt delivery, are:

Pennsylvania Railroad Coal.

Georges Creek	$1.60
Best Miller, vein	1.30
Good Miller and Moshannon	1.15
Best Gas Coal, three-quarter lump	1.25
Best Gas Coal, run-of-mine	1.15
Best Gas Coal, Slack	0.65
Ordinary Clearfield	1.00
Ordinary Latrobe	0.95

Baltimore & Ohio Railroad Coal.

Georges Creek	$1.60
Best Somerset	1.25
Somerset	1.05
West Virginia Freeport	0.90
Fairmont Dist., three-quarter lump	1.00
Fairmont Dist., run-of-mine	0.80
Fairmont Dist., Slack	0.65

Metal Market.

NEW YORK, April 1, 1908.

Pig Tin.—Business has been light, and the market uninteresting. Consumers are not in need of metal, and as they have little faith in present prices, are waiting. During the week there was only one day—March 26—when business was at all active. The following prices are for 5-ton lots and larger, spot delivery, New York:

	Cents.
March 25	32.10
March 26	31.75
March 27	31.75
March 30	32.10
March 31	31.90
April 1	31.25

The statistics compiled by C. Mayer, secretary of the New York Metal Exchange, show that the imports during March were 3662 tons, and the deliveries into consumption, 3150 tons. This increases stocks in the United States 500 tons, making them 855 tons March 31. On the same day the visible supply in Europe and the United States was 15,385 tons, an increase of 600 tons, compared with the end of February, and 2200 tons larger than a year ago. The London market has declined about £5 during the week, closing to-day at £141 5s., for spot, and £139 10s., for futures. There are afloat, for American ports, 2261 tons.

Copper.—Prices are lower, and Electrolytic can be had for domestic consumption at 13c. This price is shaded for export orders, but there is little doing in that quarter. Producers of Lake are holding prices at 13.25c., and even higher, but the difference between this price and that for Electrolytic is too wide to permit of much business being placed at that figure. The week's business was largely confined to carload orders for nearby consumption. No difficulty is experienced in making shipments promptly, as all sellers have good stocks. Europe cannot be expected to continue to take the large share of surplus metal which it has been taking during the last four months of last year, and the early part of this year. Exports have fallen off considerably, those for March amounting to only 21,600 tons. Imports are slightly heavier, as shown by the February statistics just issued by the Government, the imports for that month having been 8600 tons. The London market is about £1 10s. lower than last week, closing at £58 17s. 6d., for spot, and £59 7s. 6d., for futures. Best Selected is held at £63. Numerous mining consolidations are under way, aimed to secure a better operating efficiency. Germany's consumption in 1907 was estimated at 160,000 tons, compared with 163,000 tons during 1906.

Lead.—Little inquiry is in evidence, but Desilverized Lead is scarce, and held at 4c., New York. Soft Missouri brands can be had at 3.95c. to 3.97½c. The St. Louis market is quoted at 3.80c. to 3.85c.

Spelter.—The gradual sagging in the price of Spelter from round 4.90c. two months ago is because many brass manufacturers and some of the galvanizing works had too much Spelter in their stock rooms costing above 6c. It is

said there is considerable in consumers' hands bought at least six months ago. While business is dull, with little evidence of any buying, there is more inquiry in the market. Prime Western brands are quoted at 4.75c., New York, and probably 4.70c. could be done; 4.55c. is quoted, St. Louis. The ore market has advanced slightly, and now there is little unsold ore in Joplin.

Aluminum.—The old quotations of 33c., for No. 1 ingots, and 31c., for No. 2 ingots, continue to be named by the principal producer. A large order for wire has recently been taken for electrical transmission lines on the Pacific Coast.

Antimony.—More Hallett's is here, and is now quoted at 8.75c. Cookson's is also lower, at 8.75c. to 9c., and outside brands can be had at 8.50c. There is little business doing.

Nickel.—Quotations continue unchanged, at 45c., for ton lots, and 55c. to 60c., for smaller quantities.

Ferroalloys.—An advance in the price of 80 per cent. Ferromanganese abroad has caused some dealers in America to advance their quotations to $45, seaboard. There is, however, some irregularity in the market and on a desirable order this price could probably be shaded. So many resale lots of 50 per cent. Ferrosilicon are in the market that the irregularity is more marked than ever. Dealers quote $80, Pittsburgh, but this is more or less nominal.

Tin Plate.—The demand is good. Prices are unchanged, at $3.70, Pittsburgh, and $3.89, New York, for 100 lb. IC Coke Plates. Prices abroad have been again advanced 1½d., making the quotation for Tin Plates, in Swansea, 12s. 7½d.

Old Metals.—Trade is dull. In the absence of demand, dealers' selling prices are quoted, unchanged, as follows:

	Cents.
Copper, Heavy Cut and Crucible	12.50 to 13.00
Copper, Heavy and Wire	12.50 to 12.75
Copper, Light and Bottoms	11.50 to 11.75
Brass, Heavy	9.50 to 9.75
Brass, Light	7.50 to 7.75
Heavy Machine Composition	11.75 to 12.00
Clean Brass Turnings	8.25 to 8.50
Composition Turnings	9.00 to 10.00
Lead, Heavy	3.80
Lead, Tea	3.55
Zinc Scrap	3.50

At the annual election of the New York Metal Exchange, held March 30, the following officers were elected: President, P. R. Jennings; vice-president, Morton B. Smith; treasurer, Robert L. Crooke; members of the Board of Managers, B. Hochschild, H. W. Hendricks, L. Vogelstein, G. E. Behr, Paul Koning, George W. Jaques, Emil Baerwald, A. B. Hall; Arbitration Committee, J. Langeloth, E. A. Caswell, Edwin Groves, E. J. Keane, Humphrey D. Bond. This was the regular ticket.

Iron and Industrial Stocks.

NEW YORK, April 1, 1908.

General retrogression characterized the stock market in the period which has elapsed since the publication of the last report. In almost every case considerably lower values were realized on Tuesday of this week as compared with Thursday of last week. This was partly due to the general awakening to the belief that the improvement in business had by no means been sufficiently great to warrant a continued upward movement in the values of stocks. In the absence of specific reasons for stimulating speculative operations, the stock market naturally subsided to a lower level. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 33⅜ to 35¾, preferred 97¾ to 99¾; Car & Foundry common 30⅞ to 33¾, preferred 92 to 93½; Locomotive common 43¼ to 48, preferred 93 to 94½; Steel Foundries common, 5¼ to 5½, preferred 30½ to 31½; Cambria Steel 29¼ to 30⅛; Colorado Fuel 22¼ to 24⅜; Crucible Steel common 5¼ to 5⅜, preferred 37¼ to 38; Pressed Steel common 23½ to 25, preferred 75¼ to 80; Railway Spring common 34¾ to 36¼; Republic common 17⅞ to 20, preferred 71½ to 75; Sloss-Sheffield common 46½ to 50⅛, preferred 93; Cast Iron Pipe common 25½ to 27½, preferred 68½ to 71; Can common 4⅞ to 5, preferred 49¼ to 50¾. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 34, preferred 98¼, bonds 94⅛; Car & Foundry common 31½, preferred 94½; Locomotive common 43¾, preferred 93; Colorado Fuel 24¾; Pressed Steel common 23, preferred 75¼; Railway Spring common 34; Republic common 18½, preferred 70½; Sloss-Sheffield common 47¾; Cast Iron Pipe common 25½, preferred 68½; Can common 4⅞, preferred 50.

Notices have been sent to stockholders of the Westinghouse Electric & Mfg. Company, calling attention to a special meeting to be held in East Pittsburgh on April 29 for the purpose of voting for or against the increase of the indebtedness of the company by the issuing of bonds secured by mortgage or otherwise, also for or against the increase of the capital stock of the company, and also for or against the issuing of part or all of such new capital stock as may be authorized, or of stock now authorized but not issued, as preferred stock of the company, with such preferred or deferred provisions and features as the stockholders may authorize and the Board of Directors shall thereafter prescribe. The plan for the rehabilitation of the company has been extended for the second time, to June 1. It is probable that the proposed plan will be modified.

The American Car & Foundry Company, under date of April 1, reports its net earnings for the quarter ending January 31, 1908, at $1,772,201.47; dividends for the quarter, $825,000; surplus. January 1, 1908, $23,271,250.99; surplus to date, not including February and March earnings, $24,218,452.46.

Dividends.—The American Locomotive Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable April 21, and 1¼ per cent. on the common stock, payable May 27.

The American Brake Shoe & Foundry Company has declared a quarterly dividend of 1¾ per cent. on the preferred and 1 per cent. on the common stock.

The Great Lakes Towing Company, Cleveland, Ohio, has declared a quarterly dividend of 1¾ per cent., on the preferred stock, payable April 1.

The National Fire Proofing Company, Pittsburgh, has declared a quarterly dividend of 1 per cent.

The Pittsburgh Lamp, Brass & Glass Company, Pittsburgh, has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable April 1.

New York.

NEW YORK, April 1, 1908.

Pig Iron.—There has been a more active market, and some sales have been made for delivery into September. Practically all of the business, however, is being done by Alabama and Virginia furnaces and by a few Pennsylvania stacks. A feature has been the appearance in the Eastern markets, as sellers, of some Ohio furnaces. The result has been that prices are irregular and that Alabama Irons have been offered at $16.25, and Virginia Irons at $17, for No. 2, tidewater. We quote, at tidewater, as follows. No. 1 Northern Foundry, $18 to $18.50. No. 2 Foundry, $17.25 to $18.25, and No. 2 Plain, $17 to $17.50. Alabama Irons are $17.25 to $17.50 for No. 1 Foundry, and $16.25 to $16.50 for No. 2 Foundry.

Steel Rails.—No further announcements of Rail contracts have been made in the past week, though reference is made to business pending, which is expected to be closed in the near future. Export orders are of small tonnage. Some South American business recently figured on has gone to British and German mills.

Structural Material.—The holding back of work figured on in recent weeks indicates, in some cases, that bids will be asked again, in the hope of getting lower figures. If all that has been canvassed since the opening of the year should materialize it would mean that architects and fabricators would be temporarily hard pressed if advantage is to be taken of the early weeks of the building season. In March the American Bridge Company booked about 15,000 tons, and outside companies evidently took considerably more. Bridge business has fallen to the lowest point in many months. It is estimated that scarcely more than 5000 tons of railroad bridge work was booked last month. The construction of buildings in various parts of the country is on a scale perhaps greater than might be looked for in the generally shrunken proportions of the steel trade. Prices continue sharply competitive, and the fabricating companies have been pressing for reductions in Structural Shapes which the Steel manufacturers have steadily declined to make. From $6 to $8 a ton has come off bids for Steel construction, much of it due to lower labor costs through the better efficiency of workmen. In the past week the American Bridge Company has taken the Steel for the Barron Building, at San Francisco, and a commercial building at Spokane requiring 500 tons. The Bureau of American Republics Building, at Washington, about 700 tons, has brought some very low bids. The State Regents Building, at Albany, will require 7000 tons of Steel. We quote as follows on mill shipments, tidewater deliveries: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—Transactions are confined to small lots for immediate requirements. Bar Iron is selling at 1.40c. to 1.50c., Pittsburgh, equivalent to 1.56c. to 1.66c., tidewater. Steel Bars are maintained at 1.60c., Pittsburgh, or 1.76c., tidewater.

Plates.—The demand in this locality is still limited to small lots. Prices are unchanged, as follows, on standard sizes of Plates, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Jersey City opened bids on Monday for 1000 tons of Water Pipe on which R. D. Wood & Co., Philadelphia, were the lowest bidders at $23.35, delivered. This is regarded as quite a good price, all things considered, as it is rather better than some of the figures realized in Eastern territory a few weeks since. The city of New York opens bids on about 1000 tons to-day. Considerably larger business is expected from this city soon, as it is possible that 2800 tons may be let next week, and other purchases are to follow. The improvement association now operating at Long Beach, Long Island, is expected to be in the market in about two weeks for 3000 tons. Manufacturers report only a light demand for small lots. Some of the Eastern foundries are now absolutely refusing to meet the low prices which have for some time been current. Carload lots of 6-in. are quoted at $23.50 to $24 per net ton at tidewater.

Old Material.—Some demand is noted for Relaying Rails in moderate quantities, but the supply is large, and prices are therefore held at former quotations. Limited sales of Steel Scrap have been made, and foundry stock has had a moderate movement. Rolling mills are doing practically nothing in the market, and dealers who took contracts some time ago are finding difficulty in making deliveries of satisfactory quality to consumers. Buyers appear to be more critical than they have ever been. We quote as follows, per gross ton, New York City:

Old Girder and T Rails for melting	$9.50 to $10.50
Heavy Melting Steel Scrap	9.50 to 10.50
Old Steel Rails, rerolling lengths	10.50 to 11.50
Relaying Rails	19.00 to 20.00
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	16.00 to 17.00
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	11.50 to 12.50
Iron Track Scrap	9.50 to 10.50
No. 1 Yard Wrought, long	10.50 to 11.50
No. 1 Yard Wrought, short	9.50 to 10.50
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	15.00 to 16.00
No. 1 Heavy Cast, broken up	13.50 to 14.50
Stove Plate	11.50 to 12.50
Grate Bars	9.50 to 10.50
Locomotive Grate Bars	10.00 to 11.00
Malleable Cast	11.50 to 12.50

Seattle Business Conditions.

SEATTLE, WASH., March 23, 1908.—The iron and steel trade has shown a slight improvement in the last two or three weeks—somewhat of a recovery from the depression of the early winter. Seattle representatives of the United States Steel Corporation and its subsidiary companies say that all back orders have about been cleared up, and they are starting out with a clean slate. A few orders are received, but all large rail orders for use in the Northwest are placed in the East.

The Northwest in the next two years will use more rails than for many years, with the Chicago, Milwaukee & St. Paul and the Harriman systems extending to Puget Sound, the expected invasion of American territory by the Canadian Pacific and the construction of the Grand Trunk across upper Canada, with the possible building of the Chicago & Northwestern to the Coast. Railroad building on this large scale is attracting great attention to the Northwestern States and British Columbia, and in addition Seattle is building up perhaps with more rapidity than any other Coast city, with the stimulus of the Alaska-Yukon-Pacific Exposition to open next year. First actual laying of rails on the Milwaukee began in eastern Washington this week, and it is announced by the officials of the road that trains will be in operation over the new line by May 1 of next year, a month before the time of the opening of the exposition.

Within the last few days the Harriman franchises covering the entrance of the Union Pacific into Seattle have been passed, and soon work will begin on the terminals in this city. Operations were dragging along, following the financial depression, but the recent decision of the Interstate Commerce Commission holding that a railroad could not go beyond its own territory for business, absorbing rates to its terminus, virtually cut the Union Pacific and Southern Pacific out of the Puget Sound passenger traffic. They had been absorbing the local rate to Portland, and thus obtained a share of the transcontinental business from this part of the country. So it was that orders were sent out to the engineers to complete their plans and maps at the earliest possible moment in order that construction work might start, for Mr. Harriman wants a share of the traffic to Puget Sound during the exposition.

Terminal plans for the Harriman lines include a magnificent station within a block of that occupied by the Hill roads, the Northern Pacific and the Great Northern, the building to cost about $500,000. Work was started some time ago on a tunnel under the city of Seattle, almost paralleling the Hill tunnel, to the yards in the northern part of the city. On the waterway known as Salmon Bay Mr. Harriman plans great docks and wharves for his ocean business.

The sale of logging locomotives and other logging paraphernalia, together with rails, has been seriously affected by the depressed condition of the lumber trade, due largely to the advance in lumber rates announced some time ago by the transcontinental railroads, and to the weakening of general business conditions throughout the East and Middle West. Following the announcement of the Hill roads that lumber rates eastward would be advanced about 25 per cent., mills throughout western Washington, Oregon and British Columbia were compelled to suspend, throwing out of employment more than half of the 100,000 men directly employed by the lumber industry, which represents about 60 per cent. of the business of the Northwest. Mills shipping by water were about the only ones not affected.

For the last two or three years the lumbermen were so severely troubled by the car shortage problem that they lost much of their Eastern trade to the Southern and Norway pine manufacturers, and since the rate fight began the Westerners have had a harder struggle than ever to hold their territory. They carried the question into the Federal courts and obtained an injunction against the operation of the advanced rate, but they were required to furnish bonds aggregating $310,000 to indemnify the railroads in case the Interstate Commerce Commission should hold that the advance in rates is justified. The decision in this case, which is of so much importance to all the Northwest industries, is expected early in May. The lumbermen feel confident of winning, but are almost helpless pending the decision. It is said by railroad men that the railroads probably will reduce the rates to the old basis, even though they win. As it is now, something like $15,000,000 worth of logs and the poorest grades of timber is wasted annually because of the high transportation charges in reaching a market.

The tin plate demand for the salmon pack this year will probably be about normal. A pretty good pack of the lower grades of fish is expected, but canners and packers are not hopeful that there will be a good run of the higher grades. Next year should be a good year, according to the four year cycle theory, for 1904 saw a good yield, but nothing to compare with that of four years and eight years before.

British Columbia commercial organizations are much disturbed because much of the railroad material destined for the work in the Northern part of the province and the Yukon District is coming through Seattle instead of going through Vancouver, which is its natural channel. There is nothing in the Canadian shipping regulations to prevent the shipping of goods in bond through an American port, and the result is that Seattle is profiting to a very noticeable degree.

The Holyoke Steam Boiler Works, Walsh & Heywood, proprietors, Holyoke, Mass., has received an order from the Anglo-Newfoundland Development Company for part of the equipment in connection with that company's water power plans. Two steel penstocks will be furnished, each 15 ft. in diameter and 2600 ft. long. About 2000 tons of plates will be required for this work.

It is stated that the Pittsburgh Coal Company has recently closed a contract to supply the Crucible Steel Company of America, Pittsburgh, with 300,000 tons of coal, running over a period of years.

The Machinery Trade.

NEW YORK, April 1, 1908.

There was no noticeable improvement the past week in the demand for machinery, which was rather light, the transactions covering, with few exceptions, but a few tools each. Inquiries were not numerous, and none were reported that indicate any large undertaking aside from those that have already been mentioned in these columns and for the carrying out of which the greater portion of the mechanical equipment has been purchased. Some houses report a slightly better demand for their products, but the increase is due almost wholly to foreign business and is counterbalanced by the dullness of domestic trade with the majority of houses in this territory who are agents and who have no foreign outlet for their machines. March has been a disappointment to the trade generally, the volume of business booked being no greater than that of February, which is a shorter month and has two holidays. Though March is usually one of the best months of the year in the machine tool trade, the business of the past month with some houses was less than that of the previous month.

It is noticed in the trade that there are a large number of inquiries which are not followed with immediate business, and in some cases the same inquiries have come up several times. These inquiries cover a general line of equipment, and the fact that they are placed without being followed by orders is not taken as an indication that those asking bids are merely curious, but it is thought in the trade that there are a good many people who are in need of machinery, but for one reason or another have decided to delay their purchases. Many machinery dealers who have received such inquiries have followed them up with the request to know what has been done in the matter of the orders, and invariably the reply is that the company making the request for a bid has not fully decided on making the purchases yet. Consequently, it is thought that as soon as conditions improve to any extent the machinery trade will benefit largely. It is known that some heretofore large buyers are actually in need of equipment, and are only waiting for a slight improvement to warrant their making additional expenditures.

With a number of the more important machinery manufacturers in this territory the falling off in domestic orders has been supplemented to a large extent by the receipt of a good foreign business. Among the foreign nations which have lately been good customers is Japan, which has within the past few weeks placed large orders in this city for machinery. Among those who have secured a portion of the Japanese business is the Chicago Pneumatic Tool Company, which in addition to the several orders mentioned a short time ago has within the past few days received orders for five large air compressors.

At this time last year manufacturers' capacities were not only fully taken, but many of the more important were months behind with deliveries and were exerting every energy to enlarge their output to supply the demand for machine tools. Do what they could they found it impossible to cope with the business received. Many of them greatly enlarged their plants, but it was some time before they could secure the necessary equipment, for others like themselves were months behind with deliveries and if they installed their own make of machines their customers had to wait just so much longer. There is no doubt that many builders of machine tools would have made a great deal more money last year had they had larger plants. During the last business depression a leading machinery manufacturer made extensive additions to one of its plants. The head of the business stated at that time that when the next boom in business came he intended to be in a position to get a much larger share, and he did. The capacity of the enlarged plant was as greatly taxed as was that of the smaller one. The business of the country is increasing yearly, necessitating enlarged shop capacities, and the time to build additions and prepare for a greater business is when trade is quiet. With no rush of business to occupy all one's time one can plan better, can give more time to the selection of the tools to be installed and can get any desired deliveries. Then, too, a saving can often be made in the purchase of building material and equipment.

Secretary of War William H. Taft has accepted an invitation to address the joint open meeting of the American Supply and Machinery Manufacturers' Association, National Supply and Machinery Dealers' Association and the Southern Supply and Machinery Dealers' Association to be held at Richmond, Va., May 13, 14 and 15.

Machinery Requirements of Coatesville Foundry & Machine Company.

One of the most important inquiries before the trade is that for about $10,000 worth of machine tools for the new plant of the Coatesville Foundry & Machine Company, Coatesville, Pa. The inquiries are being sent out by Edwin T. Moore, secretary and treasurer of the Coatesville Boiler Works, who in addition to the machine tools is getting prices on 5 and 10 ton cranes and is also looking into the subject of molding machines. It has not yet been decided whether to purchase a 5 or 10 ton crane. This machine tool equipment is required for a part of the foundry building, which it is to equip as a machine shop, and it is the intention to erect later on a building the same size as the foundry, which will be thoroughly equipped as a machine shop, for which a great deal of additional machine tool equipment will then be purchased. The Coatesville Foundry & Machine Company was organized in the latter part of 1907 and has a paid in capital of $50,000. A large tract of land outside of the city limits was purchased, upon which it will erect a new plant, contract for the structural work for the buildings having been awarded to the McClintic-Marshall Construction Company, Pottstown, Pa. The main building of the plant, which is to be equipped for the manufacture of boiler fronts, grate bars, castings, &c., will be 114 x 208 ft., in addition to which there will be a pattern shop, 40 x 60 ft.; pattern storage building, &c., all of structural steel. The machine shop, for which a large amount of equipment will be purchased later on, will also be 114 x 208 ft. For the foundry, pattern shop and other smaller buildings considerable equipment has been purchased, including a 12-ton cupola from the Whiting Foundry Equipment Company, Harvey, Ill. The officers of the Coatesville Foundry & Machine Company are Penrose N. Davis, president; Howard M. Garrett, vice-president, and Frederick E. Moore, secretary and treasurer. These officers are all connected with the Coatesville Boiler Works, and the Executive Committee of the foundry company consists of the officers of the boiler works, which are Charles Edgerton, president; Nelson H. Genung, vice-president, and Edwin T. Moore, secretary and treasurer. The entire capital stock of the foundry and machine company is held by employees of the boiler works, a very broad and liberal arrangement having been made whereby the most insignificant employee may invest his savings in the company.

The Standard Oil Company, which has large construction work under way at both Bayway, N. J., and Oil City, Pa., will purchase a great deal of additional equipment for the new buildings in course of construction. It will be remembered that in the early part of the past month the company placed large orders for pumping engines, including 20 engines aggregating in value about $300,000. These were three-cycle triple expansion double acting pumping engines, with steam cylinders 20½ in. and 30 in. and 54 x 36 in. in diameter, with a piston cylinder 5 x 36 in. We understand from a reliable source that the company intends to purchase within a short time 10 additional pumping engines of about the same size as those recently purchased, the engines to cost $15,000 each. The work which the company has under way is of such magnitude that it is likely that the company will be in the market for various equipment for some time.

It is expected that during the summer the Securities Corporation, Ltd., 40 Wall street, New York, which controls among other subsidiary companies the Juanuato Development Company, will spend in the neighborhood of $4,000,000 for machinery equipment to develop mining properties in Mexico. The latter company controls a number of large mining plants in the immediate vicinity of Juanuato, Mexico, and during the last few years has spent a large amount of money for mining equipment in this vicinity. The company is now building an extensive railroad system in that territory, and its plans for the summer include the construction of a 1000 stamp mill at La Luz, in the State of Juanuato. This project, it is understood, will cost about $2,000,000, American, and a similar amount will be expended for mining and power equipment to develop the company's properties. The buying will not be begun for at least four months, but the orders, it is understood, will be placed in this country, although, as heretofore, foreign bidders will be asked to compete.

The American Car & Foundry Company, St. Louis, Mo., which intends to make important improvements to its plant at Binghamton, Tenn., has not yet completed plans for the work, which, it is understood, will include the construction of a new car wheel foundry. The company is not yet in a position to state just what new machinery it will purchase for equipping the new additions.

The Delaware, Lackawanna & Western Railroad has sent out a good-sized list covering foundry equipment for its Scranton shops on which purchases, it is understood, will be made shortly. As has been stated before, the company decided against completing all of the work laid out for this year, but it was thought necessary to put the foundry in shape. The building will be equipped with some of the apparatus which was in use in the old shops at Scranton, but the new machinery needed will amount to a large sum.

Some new machinery will probably be purchased by the Alabama & Mississippi Railroad Company, Vinegar Bend, Ala., for completing the equipment of its new shops. The company's repair shops, which were recently destroyed by fire, are being replaced by three new buildings, the largest of which is almost completed. The buildings under construction include a main structure, 50 x 100 ft.; a building 20 x 100

ft. and another 20 x 50 ft. The company will use the machinery that was in the old shops and which was not badly damaged, but has not yet decided on the new machinery it will purchase.

Builders of equipment used in the construction of subways, tunnels and water works are closely following the actions taken by the city authorities looking toward the construction of the proposed subways in Manhattan and Brooklyn and the new watershed up the State. It is thought that as soon as warm weather sets in the city will take up these matters and will let contracts for at least some of the work. The first work to be taken up will be the construction of the Fourth avenue subway in Brooklyn, contracts for the construction of which are scheduled to be advertised next Monday. The work is divided into six sections, and separate contracts for each section will be let. The estimated cost of the subway is about $15,000,000. The contracts will be let for construction only, and arrangements for equipping and operating the road will be made later. This subway is to be run from the Brooklyn end of the Manhattan Bridge under the Flatbush avenue extension to Fulton street, under Fulton street to Ashland place, under Ashland place to Fourth avenue and under Fourth avenue to Forty-third street.

The State Department of Public Works, Albany, N. Y., has awarded contract No. 26 for Barge Canal work to the Lake Erie Dredging Company, Buffalo, N. Y., for $59,795. The engineers' estimate on this work was $60,225.

Bids will be received at the office of the President of the Borough of Brooklyn on Wednesday, April 15, for six steel frame derricks, with vertical gasoline hoisting engines, which are intended for the use of the Department of Sewers.

The Board of Water Commissioners of White Plains, N. Y., will receive bids until April 17 for a 2,000,000-gal. triple expansion direct acting condensing pumping engine for the Orchard street plant.

At a meeting of the Board of Directors of the Smith-Courtney Company, Richmond, Va., held several days ago, Alvin M. Smith was elected president of the company to succeed the late George A. Smith. The new president of the company has been general manager for several years, and although comparatively a young man, he is ably fitted for the position, as he is recognized as an efficient machinery and supply man. Mr. Smith is also secretary-treasurer of the Southern Supply & Machinery Dealers' Association.

Catalogues Wanted.—The Catasauqua Castings Company, Catasauqua, Pa., whose office building was completely destroyed by fire several days ago, desires catalogues from manufacturers.

Chicago Machinery Market.

CHICAGO, ILL., March 31, 1908.

The machinery market in general continues quiet, and whatever gain there may be in business as a whole is not reflected in a noticeable increase of activity among manufacturers. Conditions which limit the operation of shops and factories to a small part of their output capacities are obviously not calculated to create a demand for new equipment. Replacement of worn out tools and machinery is and will, of course, be necessary to a greater or less degree so long as the wheels of industry continue to turn, and orders to supply such needs constitute a considerable portion of the business now coming out. Power plant development, especially in the far West, is responsible for some fair sized inquiries, embracing requirements in electrical machinery and boilers and engines. Some of these concern prospective enterprises not yet fully developed, while others are more advanced, a fair proportion of the latter having reached the stage of placing contracts for equipment. While the events of the past week have disclosed no change of noteworthy importance in the machine tool market and inquiries are apparently not more numerous than for some weeks past, it is the general consensus of opinion among dealers that more of them now represent actual needs, fewer, it is thought, being put out as market feelers. One sale of a carload of assorted tools for the equipment of a far Western shop is among the transactions reported for the week. Scattered orders from the smaller manufacturing interests widely distributed throughout the West continue to be the mainstay of the market.

The Board of Education, Chicago, will receive bids until April 17 on 24 woodworking lathes, 24 in. between centers, 10-in. swing, belt driven, for the Lake High School; also one motor head speed lathe, 36 in. centers, 12-in. swing, for the Franklin School.

Under a franchise granted to F. X. Waldron & Co., Seattle, Wash., the Vashon Electric Company is preparing to begin construction of an electric railway system and light plant on Vashon Island. The line will consist of 12½ miles of main line and an equal mileage in branches. The plant equipment will comprise two 300-kw. 550-volt d. c. generators, belted to two 400-hp. engines, and one direct connected alternating generator of 2300 volts, the latter being required to supply current for the lighting system. It is estimated that the project will involve the expenditure of $350,000, of which $75,000 will be spent upon the power plant. E. T. Heberton is chief engineer in charge of the work.

Sealed proposals will be received by the State Board of Control, Topeka, Kan., until April 29, for the remodeling of the boiler house at the School for the Feeble Minded Youth, Winfield, Kan.; also for a 75-kw. direct current generator for the same institution. Plans, details and specifications governing the submission of bids, character of equipment and execution of work can be secured from F. W. Knapp, secretary, Topeka.

Obethier & Meadows, Hereford, Texas, have secured from the City Council a franchise for an electric plant, construction of which will be begun in about 60 days. The equipment will consist of a 75-kw. 60-cycle Warren generator and a 12 x 36 in. Murray Corliss engine. The boilers for this plant have not yet been purchased.

The Santa Maria Electric & Gas Company, Santa Maria, Cal., which about eight months ago took over the Valley Electric Company, is carrying out extensive improvements upon its line, which include the rebuilding of transmission lines and power house and the installation of new boilers, generators and engines. The company is also making arrangements to furnish current for the operation of an electric road now under construction by the Pacific Coast Railway Company between Santa Maria, Guadalupe and Betteravia, and is also planning to extend its line to Guadalupe and Betteravia for light and power service.

Canon City, Colo., having disposed of bonds issued for the new water supply system, to cost about $225,000, will now proceed with the building of this project. Specifications for construction are now being prepared by Engineer Peter O'Brien, Canon City, and bids will be asked for within 60 days. L. D. Dawson is city clerk.

The San Angelo Traction Company, San Angelo, Texas, has under construction a building for new electric power plant, 38 x 52 ft., which will furnish power for the street railway. It is understood that no bids have yet been received for machinery equipment. J. H. Ransom is president and general manager.

The Ros Engine Works, Alma, Mich., has been organized to manufacture marine and automobile gasoline engines of the two-cycle two-part type, in both double and single cylinders. The officers of the company are Charles R. Murphy, president and manager; B. A. Forquer, secretary and treasurer, and R. O. Smith, superintendent.

Cleveland Machinery Market.

CLEVELAND, OHIO, March 31, 1908.

The volume of sales of machine tools during March shows no improvement on the previous month. While the majority of the dealers report that their business will aggregate about the same as February, one or two say that their sales will show a slight falling off. The demand for machinery and machine tools the past week was light, the volume and character of the sales being about the same as during the previous few weeks. Some fairly good inquiries that have been pending have not yet developed into orders and the sales have been limited to small tools. Practically all the buying is being done by small concerns, the sales in about every case being single tools. There is very little inquiry for large tools. Dealers are still carrying a large number of tools on the floors of their storerooms and it will be some time before they will need to place stock orders.

The demand for second-hand tools is about equal to that for new tools. While dealers have few second-hand tools on hand, having sold them out about as fast as they have taken them in, the scarcity that has existed in used tools will probably soon disappear, for second-hand tools are now being offered to dealers in quite liberal quantities. Dealers claim that these tools are being held at too high prices, and are slow in buying second-hand tools unless they think they are getting some good bargains.

Machine tool builders report only a very slight improvement in orders, although some of them are getting a better volume of inquiries. There is no noticeable improvement in the demand for heavy machinery. There is a little better demand for light power plant equipment, and builders of generators and motors report some improvement in orders for small sizes. Some local machine tool builders during the present period of dullness are turning their attention to the development of new tools which they have had under consideration for some time, but with which they made no headway when their plants were taxed to their utmost to fill orders. Local makers of twist drills report that the volume of their business continues to improve slowly. Some of the local automobile plants are running at about full capacity and builders of automobile parts have much more work on hand than they did a few weeks ago.

The local jobbing foundry situation shows very little improvement and the majority of the foundries are running on

about half time. Foundries engaged principally in making stove castings are now fairly well filled with work.

The Peerless Automatic Machine Company, that was incorporated several months ago, with a capital stock of $100,000, to make a new multiple spindle automatic machine, the invention of Leon F. Schulze of this city, has started to equip a plant at 1144 West Third street. The company has bought some of its machinery and is now in the market for a 16-in. lathe, one or two drills, a planer and a universal milling machine. The company has effected its organization by the election of A. T. Schraner, president; R. P. Cattrall, vice-president; A. W. May, secretary and treasurer, and Leon F. Schulze, superintendent.

The Comstock Brass Company, Cleveland, which was incorporated a few days ago with a capitalization of $10,000 is erecting an excellent plant at 2539 East Seventy-ninth street, which will be ready for operation about April 20. The plant will be 40 x 115 ft. The company for the present will engage in general jobbing business in brass castings. An order for the foundry equipment has been placed with the J. D. Smith Foundry Supply Company. The company will have a machine shop in connection with its plant and will be in the market in about 30 days for a number of special tools. It is now in the market for a 10 or 15 hp. motor. The officers are C. W. Comstock, president and treasurer; J. H. Shafner, secretary, and M. J. Arth, superintendent.

The new plant of the Standard Welding Company on West Seventy-sixth street is practically completed and the company is now doing some work at its new location. The work of moving the equipment from the old plant on Central avenue will not be completed for a few weeks, but the company expects to have its new plant in full operation by May 1. The company reports a very satisfactory amount of work on hand at the present time, there being a large increase in its orders during the past few weeks.

The Lincoln Electric Company, formerly located on East Third street, has moved into a new plant which it has just completed at Kelley avenue and East Thirty-eighth street. The building is 55 x 120 ft. and three stories high. The company builds direct and alternating current motors and generators. The new plant provides a large increase in the capacity over the old plant and the company will build a greater range of sizes, manufacturing larger sizes than it did in the old plant.

The Elyria Iron & Steel Company, Elyria, Ohio, reports considerable improvement in the business outlook. The Hart Steel Company, the selling organization for the company, has taken a number of orders for tie plates, and now has some good sized inquiries for tie plates from Western railroads.

The stockholders of the Cyclone Drill Company, Orville, Ohio, have voted to increase the capital stock from $100,000 to $200,000.

With a capital stock of $10,000, the National Cornice & Ceiling Company, Cleveland, has been incorporated by Philip Ettinger, Alexander Laks, Harry Ettinger, C. C. Hyland and R. D. Morgan.

The city of Cleveland will receive sealed proposals at the office of the secretary of the Board of Public Service on April 14 for installation of additional equipment at the municipal electric light plant, consisting of one 1000-kw. unit, including engine, generator and appurtenances.

The Municipal Traction Company, Cleveland, has notified the St. Louis Car Company that it will soon be in the market for 100 additional electric street cars.

The plant of the American Multigraph Company is now being operated with its full force of men on full time. During the recent depression the company's plant was shut down only one week.

The Shull Steel Castings Company, Canton, Ohio, which started its new plant February 1, reports that orders are coming in quite freely. The company is now employing 60 men, but expects to increase its force in a short time.

Cincinnati Machinery Market.

CINCINNATI, OHIO, March 31, 1908.

Save for a few scattering domestic orders and the receipt of some interesting inquiries, the week has been productive of little business to tool manufacturers in this section. The prevailing dullness and inactivity among the automobile manufacturers of France and Italy have greatly affected inquiries and business from that part of Europe, and save for an occasional order for a single tool or two from Germany and England there is little doing in those ordinarily busy sections. The sales during the week of a few shapers, planers and grinders in lots of five or six have encouraged builders of those types to believe that the retarded buying movement is opening up and that delayed projects will now go forward in a normal way.

One order of the week was from the Japanese Government and called for five 30-in. planers for use in the arsenals. The same concern that took this order had also an order for two planers from Germany. Another encouraging order of the week was received by one of the largest companies making a specialty of milling machines and grinders and called for five of the first and two of the second named. A shaper manufacturer received a wire order Saturday for two 16-in. back gear pattern from a large Southern city, and for immediate shipment. The significance of this order to the tool trade generally is in the fact that it was a "held up" order; the one, in fact, mentioned in the Cincinnati machinery letter of last week, in which the inquirer wanted an extra discount and refused to buy at that time because this discount was not forthcoming. The manufacturer concerned in this order had orders for seven shapers in all for the week, and all of them domestic.

The lathe manufacturers have not been so fortunate, and beyond an occasional order for a single tool nothing of any consequence has developed to suggest improvement in that line.

Another large manufacturer of tools, who recently made the trip to the Pacific Coast to study Western conditions and look up agency prospects, &c., is home, and his reports of conditions accord with that of the first of the local tool men to take in the Far West since the slump. This gentleman also found that the machinery trade was not so dull in the coast country as the East and Central sections, which he accounted for by the fact that the interests there are so largely of an agricultural nature or developments of the mining and lumber interests that the machinery interests were scattered and fewer, and competition is consequently reduced to the minimum.

The jobbing foundries have not recovered much in the past month. About the best that is being done is a three-day-a-week run, and the greater number find that they can handle about all the business that is offered in two days per week. Foundrymen, however, are hopeful of some business soon, because of the bare conditions of castings stocks. With any kind of increase in orders at the tool plants will come orders for castings, because practically all makers have been running along on surplus stocks since the first of the year.

Stockholders of the Graham Phillips Horseshoe & Iron Company will meet at the office of the company in the First National Bank Building, Tuesday, April 21, to arrange for dissolving the corporation and surrendering its charter. The business of this company was taken over about a year ago by the Cincinnati Horseshoe & Iron Company, and with the exception of Frank C. Graham, who is out, the officers are practically the same as under the old name. C. E. Hooven is president; H. Lee Early, vice-president, and William Eynon, general manager. The company owns a fine plant at Cleves, Ohio, within the Cincinnati switching district, and is running full time and with about 100 employees.

Emil F. Glaser, an architectural designer, for several years with the L. Schreiber & Sons Company, has gone into business for himself, and has opened offices in the old Western German Bank Building at Twelfth and Vine streets.

The business of Ferdinand Dieckmann, at Cincinnati, for many years conducted under that name, has been incorporated as the Ferdinand Dieckmann Company, with Otto Dieckmann, vice-president and manager, in charge. The Dieckmann factory is located at Brighton, Cincinnati suburb, and the line is sheet metal conductor elbows and shoes. All the stock is retained in the hands of those interested in the business under its former management, and the policy will not be changed.

A meeting of the Iron Buyers' Association will be held at the Phillips House, Dayton, Ohio, on Thursday, April 2, at 11 o'clock. The notice of the meeting sent out calls attention to the proposed uniform contract for the purchase of pig iron by members, and notes that reports from committees will be heard. As these committee reports will include the answers of furnaces and agents to the proposed form of contract as submitted some time ago, and in the form of an ultimatum, the meeting should prove a very important one.

President J. A. Andrews and other officials of the new steel plant on the Licking River, in Newport, Ky., are deploring the unauthorized publication in the daily papers of their intention to make a trial run this week, to which many invitations had been sent out. The officials are working hard to get the plant in shape for beginning operations in about 10 days.

New England Machinery Market.

WORCESTER, MASS., March 31, 1908.

Taken as a whole, there appears to be a slight increase in the number of orders booked for new machinery. Though the shops are no busier they are manufacturing more on orders and less on stock. Foreign business seems slightly more active. The machine tool builders who have brought out new tools that embody radical improvements are reaping immediate results, for the demand for these machines is all out of proportion to that for types better known to the trade. They figure more prominently, naturally, in the improvements

which users of machinery are making in taking advantage of the lull in business to rehabilitate their works.

While the tale of the unusual number of inquiries has been repeated in many forms, it is by no means a hackneyed topic in the trade. The nature of many of the inquiries amounts almost to an order; in ordinary times the deal would be considered as good as closed. But at the present time there is many an instance of slip 'tween cup and lip. The customer procrastinates. This is the experience all over the country, to judge from reports brought to New England by visitors and those who travel to their trade. Dealers and manufacturers like this side of the outlook, for they see in it a quick and satisfactory volume of business when the balance turns toward general confidence and its inevitable strong influence for the better.

The new works of the Universal Machine Screw Company, Hartford, Conn., will be built this season. Three acres of land in the northern section of the city have been acquired. The property is on the line of the New York, New Haven & Hartford Railroad, and is otherwise advantageously situated for manufacturing purposes. The plans have not been finally decided upon, but the buildings will contain between 25,000 and 40,000 sq. ft. of manufacturing space. A considerable amount of machine tools will be required later, but the company states it is not in the market at the present time. The matter of power has not been determined. An engine, boilers and electric equipment will be purchased, but no decision as to type has been reached. The company has just increased its capital stock from $100,000 to $250,000 to provide funds for the enlargement of its business. Its present building is no longer adequate for the purposes of manufacturing, so rapidly has the demand increased for the new multispindle type screw machines.

The storehouse of the Chandler & Farquhar Company, Boston, was wet down in a fire which damaged the upper portion of the building, March 30, but the fire itself did no injury to the large stock of machine tools on the floor. The press dispatches were in error in naming Hill, Clarke & Co., Inc., as among the losers, as they were not occupants of the building, but of that next door.

The Pratt & Whitney Company, Hartford, Conn., has received so many orders for its new surface grinder that it has been compelled to enlarge that department of its shops, increasing the working force beyond any previous payroll and operating on full time.

There appears to be an excellent chance that the Packard Motor Car Company, Detroit, will acquire the plant of the Electric Vehicle Company, Hartford, and remove its manufacturing business to that city. It is understood that the matter rests with the bondholders of the Electric Vehicle Company, which is in the hands of a receiver. A large minority of the holders of these securities already favor the transfer of the property. No great hope remains that a reorganization of the company is practicable, and it is stated that the chief reason why objection to the sale exists is a wish to resume manufacturing. The Packard Company is well organized and is financially substantial, and its addition to New England's industries would be warmly welcomed. The dealers would have a new and important customer in their territory.

The difference between the New York, New Haven & Hartford Railroad and its shop men is being watched with much interest. The company has announced the establishment of the piecework system in its repair shops, and the men and their unions resent the change. They threaten to strike if the order goes into effect. So extraordinary an action at this time would be hailed with pleasureable sensations by the thousands of mechanics who are out of work. The places of strikers would be filled with little delay, without a doubt.

The machinery industry is weathering the absence of good business in a manner to indicate a most substantial basis. Consequently an exception comes rather as a surprise. The Bridgeport Safety Emery Wheel Company, Bridgeport, Conn., went into receivers' hands on Monday, the reason given being inability to collect accounts receivable.

The Corbin Motor Vehicle Company, New Britain, Conn., has increased its capital stock from $200,000 to $500,000. The purpose of the new capital is to enlarge the business, including the plant, but it is not determined whether anything in the way of increased manufacturing facilities will be attempted this season, everything depending upon business conditions. However, business with the company has improved materially of late, in common with that of other automobile builders.

The Whitcomb-Blaisdell Machine Tool Company, Worcester, Mass., manufacturer of planers and lathes, has received a number of orders for planers from customers in France and Sweden.

A prominent builder of metal planers has sent out a circular letter to his agents all over the country, and has received replies from most of them. They agree in details of their experience that business is not good so far as actual sales are concerned, though they are selling some tools. But, on the other hand, inquiries are very numerous. One dealer wrote that inquiries were as plentiful as during the most prosperous period of the recent good business. When he sought to close business, however, he was unsuccessful in most cases. The replies from other agents were along these same lines. One Western railroad is contemplating placing large orders for machine tools, but the culmination of the plan has not been reached. The railroads, as a whole, have not yet begun to buy.

The Challenge Brass Company is the new company that will operate the plant formerly conducted by the Nettleton & Kelsey Company, 501 Quinnipiac avenue, New Haven, Conn., allusion to the sale of which was made in this column last week. The new owners are E. F. Millett and W. H. Burt, who were formerly foremen in the employ of the Waterbury Mfg. Company, Waterbury, Conn. The company will manufacture brass, bronze and aluminum castings and babbitt and type metals. It is proposed to enlarge and extend the business.

The Wm. H. Page Boiler Company, Norwich, Conn., whose plant was burned recently, has begun the removal of the Norwich business to the company's new works at Meadsville, Pa. It is stated that a new company will be organized at Norwich to manufacture house heating boilers, the interested parties being headed by a prominent employee of the Page Company.

The Stockbridge Machine Company, Worcester, Mass., manufacturer of shapers, is building a lot of four of a new type of shaper on order from a customer. It will later be added to the company's regular line. It is an 18-in. machine, all gear driven for constant speed drive from single pulley or direct connected motor. The Stockbridge Company reports an increasing number of orders. Up to a month ago the new business booked was largely from abroad and the Pacific Coast, but later orders are confined principally to the Eastern States. The company is running its shops 40 hr. a week with reduced force, but is manufacturing on orders entirely, having secured a sufficient number of tools for stock.

Walsh's Holyoke Steam Boiler Works, Holyoke, Mass., is reported to be in the market for machine tools.

Philadelphia Machinery Market.

PHILADELPHIA, PA., March 31, 1908.

The volume of new business which has come out in the local machinery market the past week has been comparatively small. Manufacturers and dealers report a slight let up in the demand, but as business in the past few months has been more or less irregular, the lack of orders now is not looked upon with any apprehension. The week to week business is hardly considered as indicating the condition of trade under existing circumstances; frequently an entire absence of orders is to be noted for several days at a time, the deficiency being made up by the number sometimes taken in a single day. On the whole the business averages up to about the same volume from month to month. In some directions gains are to be noted, but they are not large, as prospective buyers have, in most cases, not yet made up their minds to make purchases, even though the equipment may be badly needed. The large industrial plants are still out of the market, as they find little improvement in the demand for their various products, and until this develops little buying can be expected from those sources. The railroad situation is unchanged, and there has been no further development of business in that direction. Municipal improvements, however, will have some indirect effect on the trade, as should also the work of elevating the Philadelphia & Reading Railroad tracks in certain portions of the city, in connection with which a considerable amount of work is yet to be placed.

While manufacturers are not able to report any particular increase in orders received, there is a more hopeful feeling expressed as to the future. Machine tool builders are still operating their plants on a very largely restricted basis and in some cases production does not exceed over 40 per cent. of the normal capacity. In other instances, however, particularly in the manufacture of specialties or power equipment, some further improvement in the volume of business coming in is to be noted and some plants have for the time gone above the 50 per cent. mark, which, for a long time, seemed to be as well as could be done. Whether this gain can be maintained is yet to be determined, but a more hopeful feeling is expressed and it is believed that before the close of the second quarter of the year some more permanent improvement will be noticeable.

Inquiries have hardly been as numerous as they were the previous few weeks. They are still usually confined to single tool propositions, with an occasional small lot coming out; mostly, however, of the smaller classes of tools. Sales have been almost entirely of the smaller and medium sized tools—drill presses. Small lathes and grinders have had the best sale, while an occasional order has been taken for a milling machine, boring mill or a larger lathe.

The foreign demand, as far as machine tools are concerned, shows practically no change. There has been a bet-

ter demand for some of the power transmission specialties, and manufacturers of these lines report a considerable increase in orders.

The second-hand machinery market about holds its own. The demand is not large, but there has been a fair sprinkling of business coming out from week to week, and dealers report more inquiry. Both metal and woodworking machinery are reported in fairly active demand, with a moderate inquiry for second-hand pumps, engines and boilers of medium size.

There is little change in the situation as far as the foundry trade is concerned. The demand continues light, reflecting the general condition of the machinery and building trades. No particular gains have been made in the output of either steel or gray iron casting plants, and the business taken continues largely of a day to day character.

Announcement has been made of a contract awarded to John Dobbling, York, Pa., for an extension of the Hanover street railroad from Hanover to Littletown, Pa., by the way of McSherrytown, a distance of 7 miles. Another extension is projected from McSherrytown to Oxford, a distance of some 5 miles.

The Standard Engineering Company, Land Title Building, was the lowest bidder at $127,667 for furnishing a power plant and equipment for the Great Lakes Naval Station for the United States Government, bids for which were recently opened. This work includes a battery of boilers, direct connected engines and four 175-kw. electric generators. A heating plant is included as part of the equipment.

The Royersford Foundry & Machine Company, Royersford, Pa., has discontinued the manufacture of cast iron pulleys as a branch of its business, and will dispose of the entire equipment for their manufacture, including molding machines, turning machines and other equipment. This company reports a fair demand for its line of punch and shearing machinery, a recent order being for a No. 2 machine for the Ellis Keystone Agricultural Works, Pottstown, Pa. In its power transmission department business is not reported active, orders being largely of a hand to mouth character.

Sealed proposals will be opened April 2 at the office of the Board of Education, room 392, City Hall, by the superintendent, department of supplies, Board of Public Education, for mechanical and other equipment to be installed in the Southern and Central manual training high schools. The equipment required is largely composed of the smaller classes of machine tools, &c., including six drill presses, six grinders, a band saw, and a combination wood lathe.

The Standard Pressed Steel Company reports an increased demand for its line of pressed steel shaft hangers, particularly from abroad. Some little improvement has also been noted in the domestic demand, one order for 400 hangers having been taken from a concern in the Middle West and another for 100 hangers from parties in Iowa. An order for 60 extra large hangers has been received from Vienna, Austria, while good orders have been taken from other foreign countries and from Canada. While an improvement has been noted in sales recently, the demand is still reported somewhat irregular.

The E. H. Mumford Company, manufacturer of molding machines, reports some improvement in the demand, particularly from the Middle West, where sales have recently been made of split pattern and jolt ramming machines. Several installations of the Ph. Bonvillain & E. Ronceray types of machines and equipment have about been completed, and the demand for this class of equipment is reported good. The Mumford Company has now become pretty well established in its new quarters, 1223-1225 Spring street, to which it recently removed its office and showrooms.

Government Purchases.

WASHINGTON, D. C., March 31, 1908.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until April 7 for four electric motors, seven induction motors, one boiler, one engine lathe, one drill, and other supplies for the Eastern navy yards.

The Isthmian Canal Commission will receive bids until April 20, circular No. 434, for engine, power hammer, belt driven punch, power shears, blacksmith drills, forges, tinsmiths' punches and other supplies.

The following bids were opened March 24 for machinery for the navy yards:

Class 21.—Item 1, ammonia compression plant—Bidder 60, De La Vergne Machine Company, New York, $13,200; 73, Frick Company, Waynesboro, Pa., $9000; 214, Vilter Mfg. Company, Milwaukee, Wis., $9350; 227, Erie Foundry Company, Erie, Pa., $8825.

Class 71.—Fifty pneumatic scaling hammers and spare parts—Bidder 39, Cleveland Pneumatic Tool Company, Cleveland, Ohio, $1531.80; 51, Chicago Pneumatic Tool Company, New York, $925.60; 107, Helwig Mfg. Company, St. Paul, Minn., $1425; 110, Independent Pneumatic Tool Company, Chicago, Ill., $1007.35; 159, George Oldham & Son Company, Frankford, Pa., $1382; 197, Standard Railway Equipment Company, St. Louis, Mo., $1700.

Class 72.—Five pneumatic hammers and spare parts—Bidder 39, Cleveland Pneumatic Tool Company, Cleveland, Ohio, $165; 51, Chicago Pneumatic Tool Company, New York, $119.90; 107, Helwig Mfg. Company, St. Paul, Minn., $147.75; 110, Independent Pneumatic Tool Company, Chicago, Ill., $127.35; 159, George Oldham & Son Company, Frankford, Pa., $172.75; 197, Standard Railway Equipment Company, St. Louis, Mo., $170.

Class 73.—Three pneumatic hammers and spare parts—Bidder 39, Cleveland Pneumatic Tool Company, Cleveland, Ohio, $329.20; 51, Chicago Pneumatic Tool Company, New York, $65.90; 107, Helwig Mfg. Company, St. Paul, Minn., $97.80; 110, Independent Pneumatic Tool Company, Chicago, Ill., $79.25; 159, George Oldham & Son Company, Frankford, Pa., $92.45; 197, Standard Railway Equipment Company, St. Louis, Mo., $105.

Class 74.—Six nonreversible pneumatic drilling machines and spare parts—Bidder 39, Cleveland Pneumatic Tool Company, Cleveland, Ohio, $329.20; 51, Chicago Pneumatic Tool Company, New York, $230.25; 110, Independent Pneumatic Tool Company, Chicago, Ill., $277.26; 197, Standard Railway Equipment Company, St. Louis, Mo., $402.

Class 75.—Six pneumatic wood boring machines and spare parts—Bidder 51, Chicago Pneumatic Tool Company, New York, $230.25; 110, Independent Pneumatic Tool Company, Chicago, Ill., $277.86; 197, Standard Railway Equipment Company, St. Louis, Mo., $384.

Class 76.—One pipe yoke riveter and spare parts—Bidder 51, Chicago Pneumatic Tool Company, New York, $214.70; 231, Excelsior Equipment Company, Pittsburgh, Pa., $237 and $765.

Class 77.—One pneumatic tube cleaner and spare parts—Bidder 5, Thomas Andrews Mfg. Company, Rockaway, N. J., $235.20; 35, James S. Clark, New York, $711.50; 126, Liberty Mfg. Company, Pittsburgh, Pa., $499.75.

Class 81.—One motor driven punch—Bidder 44, Cleveland Punch & Shear Works, Cleveland, Ohio, $1200; 101, Hilles & Jones Company, Wilmington, Del., $895; 129, Long & Allstatter Company, Hamilton, Ohio, $980; 161, Prentiss Tool & Supply Comapny, New York, $957; 200, Scully Steel & Iron Company, Chicago, Ill., $1055; 206, Toledo Machine Tool Company, Toledo, Ohio, $1033; 221, Wickes Bros., Saginaw, Mich., $829.

Class 101.—One motor driven gate shear—Bidder 44, Cleveland Punch & Shear Works, Cleveland, Ohio, $5925; 57, Camden Iron Works, Camden, N. J., $4450; 101, Hilles & Jones Company, Wilmington, Del., $4985; 129, Long & Allstatter Company, Hamilton, Ohio, $5984; 237, Erie Foundry Company, Erie, Pa., $6817; 238, Morgan Engineering Company, Alliance, Ohio, $7150 and $7225.

Class 136.—Six hydraulic jacks—Bidder 20, Brooklyn Forge & Supply Company, Brooklyn, N. Y., $297.60; 23, Batcheller, Clark & Batcheller, New York, $282.45; 33, William Wirt, Clark & Son, Baltimore, Md., $305.28; 79, Fairbanks Company, New York, $283.20; 94, R. W. Geldart, New York, $293.94; 123, J. R. Kendall, Washington, D. C., $258; 134, Manhattan Supply Company, New York, $282; 144, Montgomery & Co., New York, $282; 145, Manning, Maxwell & Moore, New York, $296.28; 164, S. N. Price Machinery Company, Norfolk, Va., $300; 179, J. B. Roach, Brooklyn, N. Y., $253.20; 191, H. A. Rogers Company, New York, $291; 207, Tucker Tool & Machine Company, New York, $279.60; 212, Vermilye & Power, New York, $275.75.

The following bids were opened at the office of the superintendent of United States Capitol Building and Grounds, Washington, March 21, for a 60-ton electric traveling crane:

Cleveland Crane & Car Company, Wickliffe, Ohio, $9245; M. K. Kellogg Company, Jersey City, N. J., $9390; Pawling & Harnischfeger, Milwaukee, Wis., $11,300; Whiting Foundry Equipment Company, Harvey, Ill., $9520; Modern Steel Structural Company, Waukesha, Wis., $8700; Morgan Engineering Company, New York, $9390; Alfred Box & Co., Philadelphia, Pa., $9000; Alliance Machine Company, Alliance, Ohio, $10,995; Manning, Maxwell & Moore, New York City, $8475; Case Mfg. Company, Columbus, Ohio, $10,500; Northern Engineering Works, Detroit, Mich., $9275—if cast steel trolley sides are used, add $235; Niles-Bement-Pond Company, New York, $8240—if awarded contract on a four-wheel crane will furnish same for $7990.

The following bids were opened for an engine and compressor for the Humboldt Bay fog signal, Cal.:

Western Gas Engine Company, Los Angeles, Cal., $1617.50, accepted; Northwestern Iron Works, Seattle, Wash., $2400; Harron, Rickard & McCone, San Francisco, Cal., $1820, $2754.54 and $2941.50; Union Gas Engine Company, East Oakland, Cal., $2368; Rix Compressed Air & Drill Company, San Francisco, Cal., $1605, incomplete.

The following awards have been made for machinery for the navy yards, bids for which were opened November 26:

Philadelphia Pneumatic Tool Company, New York, class 171, 75 pneumatic scaling hammers, $1382; 172, 30 pneumatic calking hammers, $651.90; 173, 95 pneumatic chipping and calking hammers, $1986.30; 174, three pneumatic hammers, $65.90; 175, 20 pneumatic hammers, $616.60; 176, 40 pneumatic hammers, $1233.20; 177, 15 pneumatic hammers, $469.10; 178, 25 nonreversible pneumatic drilling machines, $965.85; 179, 40 nonreversible pneumatic drilling machines, $1706; 186, 20 pneumatic breast drills, $522.70; 187, 10 pneumatic drilling machines, $792.90; 188, 12 pneumatic drilling machines, $1004.10; 191, 20 pneumatic holderson, $300; 192, two jamd riveters, $162.40; 193, three jamd riveters, $237.40; 194, 20 electric breast drills, $781.80; 195, 20 electric drilling machines, $882.40; 196, 20 electric drilling machines, $1424.70; 197, five electric drilling machines, $408.30; 198, five electric drilling machines, $510.

Independent Pneumatic Tool Company, Chicago, Ill., class 182, 20 nonreversible drilling machines, $1576.90; 183, two pneumatic boring machines, $586.60; 184, 20 pneumatic boring machines, $1185; 185, 10 pneumatic boring machines, $595.50; 190, four flue rolling and tapping machines, $256.30.

Class 189, 12 pneumatic drilling machines, has been canceled.

Under bids opened March 3 for machinery for the navy yards, the Berlin Machine Works, Beloit, Wis., has been awarded class 91, one band saw mill equipment, $9397.20.

The following awards have been made for supplies for the Isthmian Canal Commission, circualr No. 426, bids for which were opened March 16:

Motley, Green & Co., New York, class 6, two duplex steam pumps, $1370.

Phœnix Iron Works, Meadville, Pa., class 7, two vertical tubular boilers, $1570.

HARDWARE

THE subject of freights is for merchants and manufacturers a complicated one, and on this account usually receives less attention than its importance represented in dollars and cents demands. Recent legislation in some respects may seem to simplify it and to give the ordinary shipper of small or medium quantities a degree of protection against overcharges, while it tends in various ways to conserve his rights and promote his interests. There is, however, still sufficient complexity in the management of freights—securing the delivery of goods at the lowest cost and under the most favorable conditions—to commend a proper care of this important matter to many who are too much accustomed to accept charges and conditions as they find them and to neglect details of routing, classification, rates, the receipt of commodities in good condition, &c. Knowledge and care in this department would, however, yield results in more than one way directly advantageous. With the large concerns these details are of sufficient importance to justify the employment of competent persons whose business it is to look after freights and transportation of goods coming in and going out. With houses doing a manufacturing or a distributing business of much less volume the conditions are very different. Such firms or companies cannot afford to employ a traffic manager to attend exclusively to freight matters, and these are handled by members of the management as part of their ordinary routine. They are apt to lack familiarity with the subject and are consequently unable to grapple in a practical manner with the problems presented, and are thus frequently subjected to imposition and overcharges which with proper care and vigilance might have been prevented. In view of these conditions the articles we are publishing from time to time on this subject, especially as relating to the shipments of merchants and manufacturers of moderate standing, will be found, we believe, instructive and helpful, written as they are by persons in direct contact with transportation matters and thoroughly familiar with the subject theoretically and practically. To aid in the discussion of the subject we invite inquiries and suggestions from our readers, with a view to our furnishing information which will be of the greatest practical usefulness to them in connection with their attention to freight matters.

The cash discount coupon is the latest form of trading stamp scheme in which promoters are trying to interest the retail merchant. In connection, however, with its introduction in a New England city the Business Men's Association there took up the matter and through its president published in the local paper a formal warning against those who were fathering the plan. The notice, which is formally signed, advises investigation of the promoters' claims regarding subscribers secured and explains that the scheme has been disapproved by the association's committee. Organized opposition to the scheme is certainly to be commended, and this method of opposing it should be effective. The inception of most such practices is in the playing of one merchant against another, and this tends to result injuriously to the general interests of the town or city. Where there is a local merchants' association such a method of introducing a trading stamp or any other doubtful form of advertising or trade inducement should be impossible, for members can consult together and in their mutual understanding act intelligently in turning down the proposition. Attempts to revive the trading stamp scheme in any form should be frowned upon; it has no place among legitimate business methods.

Condition of Trade.

The influence of the caution and conservatism which characterize trade in practically all branches is felt in more than one direction. It tends on the one hand to prevent manufacturers from pursuing an aggressive policy in the production and marketing of their goods. They are accordingly keeping down the output of their factories by running only part time and with considerably diminished forces. In following this course they are at the same time keeping close to shore financially and avoiding an undue accumulation of product which might be troublesome to carry and would constitute something of a menace to the market. Their conservatism is, however, seen also in the degree of steadiness with which prices are maintained. With the situation, in which there are several elements of weakness, it is to the credit of manufacturers in most lines that prices have not become more seriously demoralized. The present period of reaction from the heavy pressure of business which has for so long been a feature of the market is noticeable for the selfrestraint exercised by manufacturers and the efforts made by them with a view to sustaining the market as a whole. The conservatism of buyers on the other hand naturally and indeed necessarily operates in the limiting of the volume of business, as orders are placed as a rule only for such quantities as the immediate exigencies of trade require. This reluctance to buy freely is encouraged by the general disposition on the part of the public to economize, and even in the agricultural sections where there is much less of the effect of distrust and financial disturbance than is experienced in the cities and industrial centers, the curtailment of business is noticeable and in some cases marked. An illustration of this is seen in the diminished business, according to general report, of the great catalogue houses. In these circumstances the business which is doing must be characterized in general as of moderate volume, but varying materially according to the location and kind of goods. In the heavy products and materials concerned in railroad and large work the demand is decidedly sluggish, and mechanics' tools, except in the agricultural sections, are moving slowly. Seasonable goods give little reason for complaint and constitute a good proportion of the current demand. While the finer goods in the line of Shelf and general Hardware are suffering less than Heavy Hardware and the cruder products, an important feature of the market which must be taken into account is the diminished consumption of iron, suggesting questions as to the future course of prices in this material. Thus far the great interests are working together with commendable conservatism, and the policy pursued by them has had an excellent effect on the market, the advantages of which continue to be experienced by the trade. There is reason to hope that the disposition to united action along conservative lines will prevent too

early and too radical reduction in values. Whatever may be anticipated in this direction, the proper policy for Hardware merchants, large and small, is to conduct their business conservatively and hopefully, making the best of the present opportunities, and seeing to it that their caution is accompanied by courage and energy, with persistent efforts to market goods wisely and successfully.

Chicago.

Whatever may be said of trade conditions generally and the probable effect of this or that influence upon the financial or industrial developments of the future, it is a fact that, notwithstanding the indisputable evidences of depression which mark the present situation, there is a strong disposition among Hardwaremen throughout the Middle West to regard the outcome with hopeful equanimity, tempered, of course, by sane moderation in a forecast of results. In the various assemblages of retail dealers gathered in the recent State conventions, and at that of the national convention held last week at St. Louis, the expressions heard concerning trade prospects were reassuring in that they reflect not oversanguine hope, but rather a firm confidence in the development of a fair volume of business during the coming season. The prevalence of springlike weather has perceptibly quickened consumptive demand, which in turn can reasonably be expected to result in more replenishment orders from the retail trade; for, according to accepted estimates, stocks are generally below normal, and when seasonable lines begin to move should require frequent renewals. In reviewing the progress of current events the natural tendency is to compare present results with those of last year, which, so far at least as volume goes, were admittedly abnormal. Measured, however, by the average of previous years the business of March will suffer little by contrast. Considering the pressure of competition between manufacturers growing out of eagerness to secure their respective shares of available orders, the general level of values has been more evenly maintained than might have been expected. There is inevitably more or less weakness noted in some lines, but in the heavy staples, such as Wire and Wire products, there are no important lapses from regular price schedules. However, the strongest supporters of the policy of sustaining prices made no concealment of the fact that ultimate readjustment may become necessary, but before contrary winds compel a shifting of the market course all sails will have been trimmed and set to make the tack without the careening strain of an unexpected squall.

Cleveland.

THE W. BINGHAM COMPANY.—"As the days begin to lengthen, trade begins to strengthen," and we believe from reports we are getting from different sections of the country that the "advance agent of prosperity" is on the road again. Take, for instance, the splendid showing of the United States Steel Corporation just published—that is, the immense business done by it last year and the encouraging reports given of orders placed in January and February of this year—namely, 25 per cent. more in January than December, and February 25 per cent. more than January. This report goes a long way to express a hopeful view of the future. The large order recently given by the New York Central Railroad for over a hundred locomotives, and for many tons of steel rails, is a good omen of the starting of new railroad business.

Now that the United States Supreme Court have declared that some of the drastic laws that were passed by some State legislatures are unconstitutional, it may have the effect on capitalists to turn more money into the channels of railroad and transportation companies, enabling them to renew and increase their facilities, which, we all know, is greatly needed. In the last four months the purchases of the railroad companies have been very small. They have been working up all the odds and ends that were thrown in the junk pile or scrap heap, but there is not much left, and they are getting now to the point where they have got to make purchases and not only refit old engines, cars, tracks, &c., but build new equipment, and just as soon as this starts in, which bids fair to be soon, it will go a long way toward reviving trade and traffic in the supply line, for confidence is being restored.

The business sentiment seems to be more cheerful all around. Of course, we understand the actual progress in commercial channels is always slow, but there is a little improvement each week, and the opening up of spring will stimulate the trade very much.

To show how well our securities are thought of abroad it is reported that during the recent panic Holland investors purchased from $15,000,000 to $20,000,000 United States Steel common stock; German investors also purchased large blocks of this stock. The transfer books of the Steel Corporation, it is said, show that 150,000 to 200,000 shares of their stock were entered on their books with foreign addresses. This goes to prove the confidence that our brothers on the other side of the Atlantic have in our industrial corporations.

If the continued economies and savings of our people keep on we are going to accumulate a great surplus. For instance, say each person saves 5 cents a day, then 80,000,000 people would save $4,000,000 daily, and in a year it would amount to $1,400,000,000 to $1,500,000,000. It is said our prosperity from 1900 to 1906 led us into a career of gambling and extravagance, and now we are on the other tack, and the depression through which we have passed will have a very beneficial effect, we believe, and many people will lay aside many dollars for future use that will come in very handy in future deals.

The general trend in the Hardware business in this section is very fair. Orders for spring goods are coming in quite freely and such orders are well assorted, showing that the stocks are light in the hands of the retailer and they are not afraid to purchase in a liberal manner for their immediate wants. They are a little timid, however, about tackling futures, but they will get over this very soon, with the opening of spring weather and bright skies, and with cheerful and hopeful conditions we will all feel better and take hold of business affairs with renewed energy. You cannot keep good men down long and the business communities are asserting themselves all over the country, and we are having and looking for better trade conditions from now on.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Since our last report conditions have not materially changed. The volume of business with the Hardware jobbing houses seems to be about 20 per cent. less in the spring months this year than it has been in former years. Jobbers and retailers do not seem anxious to do business without a profit; consequently, prices are pretty well maintained. The foundries, of which there are quite a number in the city, are curtailing their output by running four days in the week instead of six, as they haven't found sufficient demand for their product to justify them in running full time. We have had some beautiful weather in the past 10 days, and the preliminary work for producing the crop for 1908 is well under way. Collections are about as usual at this season of the year.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—This week our correspondence has been neglected. Have not even had time to think up an article for *The Iron Age*. All the Hardware jobbers of this city have been busy entertaining the delegates to the National Retail Hardware Association, which has been holding its annual convention in St. Louis this week.

All of us have enjoyed this convention very much. The same rivalry that has always existed in this city between the several Hardware jobbers in selling goods, has come to the front in a friendly way, in entertaining the delegates. Each jobber has attempted to outdo the other, and as a result we are told our guests cannot complain of any lack of hospitality.

When the writer was in Boston seeking the convention for the city of St. Louis, he made some pretty strong promises. The delegates tell me that they find these promises have been fulfilled. If this is true, we have every reason to feel satisfied.

Notwithstanding the competition in the way of en-

tertainment, as far as we know there has not been an unpleasant or disagreeable incident.

The writer will say frankly he enjoyed the Boston convention more than the St. Louis meeting, but probably this year there were more responsibilities on his shoulders.

We congratulate our sister city, Milwaukee, on obtaining the convention for next year, and we are sure the delegates will meet with a warm welcome in that city.

We will now proceed to clean up the accumulation of work on our desks, and if any of our correspondents are impatient at the delays in replying to their letters we trust they will accept our apologies.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The market continues to improve slowly. The value of each order is being somewhat increased, and it really looks as though we were having a wave of genuine spring trade. Whether this is destined to last or whether we shall have another period of quiet in May and June is the question. A good many astute buyers think it likely that we shall experience the latter. Manufacturers generally admit the partial employment only of their plants, and we all have to talk very bravely in order to keep prices on the present level. The railroads have taken heart since the last decision, but we never know what morning we are to wake up and find a new lot of suggestions from national headquarters as to what should be done in the shops and warehouses and in all the callings of life.

The employment of Government agents or detectives to look into the matter of the Louisville & Nashville Railroad Company, seems to be generally conceded. What the result of their reports was has never been published, but for the time being the proposed reduction of wages has been withheld. When there is not enough work for all it means that some have to go altogether, or that all have to stand their share of the reduction. Nearly all institutions, particularly railroads, may thus be obliged to operate at a loss until a readjustment in all departments takes place. Just how to make a profit is certainly the province of those who have been elected to the leading positions in the manaegment, and it is pretty rough to be told by an outsider how, even if he speak *ex cathedra*. The demand for Athletic Goods is marked. We cannot remember when more interest has been taken in baseball, and tennis and golf promise to claim their share.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Figures are funny fellows. Figures of speech; figures as used in printed interviews, and, we fancy, in a good many unauthorized statistics given in the last three or four months, are going to make a lot of us see the wisdom in the corrected version of the old Saw, "Figures can't lie." But "Liars can figure."

During the last few months any optimistic plain citizen, who ventured to express the opinion that times were not so awfully bad, and that they were getting better, was apt to be confronted with an array of figures, showing the decreasing clearing house statements; the great number of idle freight cars and locomotives, and the constantly decreasing business of the railroads, as shown in their monthly statements, all of which were very convincing, especially if he had no means of knowing anything about the other side; if, for instance, he did not know that a goodly number of freight cars were apt to be idle in the winter, and remember that sometimes corporations are tempted to make the figures in their reports serve the double purpose of checking a labor demonstration, and proving that there had been too much politics in connection with business.

We feel that even the most determined opponents of the Administration's policy toward corporations will be agreeably surprised at the end of the year when the true balance sheet is struck, and we welcome the approach of warm weather, which will give us all less opportunity to read the newspapers, and more to get our hands soiled with work out of doors.

If Mother Nature has heard anything of the hard times she has given no intimation thus far of having been in the least disturbed by it, as from all accounts crops are coming forward, if anything, earlier than a year ago. The demand for seasonable Hardware has been quite noticeable, for its increase within the last fortnight; collections are better and money fairly abundant.

Baltimore.

CARLIN & FULTON.—The warm weather of the last few days has given an impetus to business in the lines of Agricultural Tools, and indicates that the farming community is getting ready for business. Very soon the "Man with the Hoe" will be greatly in evidence. A little more warm weather will also stimulate the demand for hot weather supplies, and the Refrigerator, the Ice Cream Freezer, the Hammock and the Lawn Swing will be greatly needed, and not classed as luxuries either.

In the plan of creation the uselessness of the ordinary house fly and of the mosquito has been quoted, but when we think of the great amount of business in Wire Cloth and in Screen Doors and Windows resulting from their activity we think they should really be put on the salaried list of the Hardware trade, as they are important adjuncts in the distribution of these goods.

The demand for Building Hardware, while improving, has not yet reached the proportions of last year. Lumber and some other materials may be somewhat lower, but labor still continues high, and while many are out of work yet there seems to be little disposition to announce any voluntary reduction in the rate of wages for skilled mechanics.

Business in the mining sections is undoubtedly quiet, while it is equally dull in the lumber districts, but with these exceptions outside of the manufacturing centers, the activity of trade is undoubtedly increasing, depending upon the absolute necessities of a population whose daily consumption of goods is enormous, and who have undoubtedly more wealth per capita than any other nation on the face of the earth.

New Orleans.

WOODWARD, WIGHT & CO.—There is a little better demand coming in now with the beginning of spring, but it is still fitful, still on the hand to mouth order, and no large stock orders are being placed by any one. At the same time, there is a substantially better feeling among everybody here. While we do not see any actual betterment, perhaps, except in the way the bank reserves are getting on, yet at the same time we are all feeling cheerful. We have the outlook for good crops, and have got ourselves to a certain degree adjusted to the new conditions.

We all look for the next 60 days to tell the story of the crisis. If the improvement reported by our Northern friends, who have been down here to escape the cold weather, continues, and if we begin to see actual improvement here, we expect to see the orders coming out in more solid blocks of stuff and not quite so much variety and so little weight to a wagonload.

The lumber industry is particularly dependent upon the next 60 days, but cotton, rice and sugar are also interested. The last three industries feel that if the next 60 days are as good as the last two or three weeks, we have every prospect for good crops and good business.

A great deal of improvement is going on in the city here in the way of municipal work—drainage, sewerage and paving—and this has tended to keep enough labor employed and still enable us all to get a fair day's work for a day's labor.

Collections are coming in quite a little better than they were before, and we are all of us getting paid in full now, instead of being paid on account.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—Trade during last half of March has improved considerably, and has now reached fair proportions. The increase in this period has been in about the usual relative ratio with that of preceding years, and if this condition holds during the balance of the spring, as it very probably will do, the situation will

be favorable at the closing of the first half of the year. At that time the determining factor will be the condition of the grain and grass crops. About the usual amount of small grain will be seeded this season, and the same may be expected of corn and other crops.

The weather throughout March has been open and mild, as the entire winter has been; so much so indeed as to have rendered it unnecessary for those to go to milder climates during the winter who wish to avoid the rigor of our normal years.

The trade is watching closely the movements of manufacturers in the maintenance of prices, and hopes to see the production lessened in cases in which this is necessary rather than have prices cut.

The efforts of all the manufacturers who are working on this line are fully appreciated.

Collections are about up to expectations.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—Prospects for business in this section of the country continue to improve. All lines of business are looking up, especially lumber. Lumbering was dead for a time, but more and more mills are beginning to operate, and some of those in export business are working double shifts.

As near as anybody can tell at this very early date crops will be good this year, and if people would only devote their attention to business instead of worrying about politics, we can see no reason why this should not be a profitable year on the Pacific Coast.

The recent slump came at a time when really its effects were beneficial to the jobbers on this coast, as they were beginning to stretch out a good deal more than their capital justified, and to extend in some cases longer credits than were businesslike. These bad habits were just beginning, and the recent flurry brought them to a realization of this bad policy before they had gone far enough to really injure themselves. To-day on the coast, and especially in Portland, business is on a better footing, we believe, than it was one year ago; that is to say, while all of us are not doing as much business as at that time, the business we are doing is safer, saner and, in the long run, more profitable. This we think will apply not only to the Hardware business, but to all lines.

The fact that Portland was not affected other than superficially by the recent panic is to a certain extent indicated by a comparison of real estate values, which have at the very least maintained the level reached just before the flurry. In some cases transfers have been made at 10 and 15 per cent. advance over the prices asked at that time. Building permits continue to be issued in large numbers for dwelling and apartment houses, and bank clearances compared with those of the same time last year are considerably higher than those of any other city on the coast. However, the rest of the coast is, we believe, sharing to a great extent in the better business conditions, and we look forward to a good year on the whole coast.

NOTES ON PRICES.

Wire Nails.—Orders covering specifications and new business are being received by the mills in fair volume. There is urgency expressed in many instances for prompt shipments, showing stocks in merchants' hands are light. Orders are restricted to conservative quantities, which indicates that they are designed to cover near-by requirements, and that buyers see no reason for anticipating supplies for extended periods. There is no indication of an immediate change in prices, and demand is less than the capacity of the mills, which are to some extent curtailing production. Regular prices are reported as being maintained. Quotations are as follows, f. o. b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—The number of kegs of Wire Nails sold in small lots at store during the month of March was larger than for the preceding month. The increased sales did not, however, represent a very large volume of business. Nail houses are represented as maintaining regular prices, but it is reported that jobbing houses sometimes shade prices when Hardware is also sold. Regular quotations are on the basis of $2.40 for small lots at store.

Chicago.—The hesitation shown in the movement of other mill products is not apparent in Nails and Wire. Specifications and new business are being furnished in fairly good volume, and there is an increasing amount of urgency in the demands of buyers for prompt shipment. Present indications point to continued improvement under the influence of more rapid consumption, which can reasonably be expected as spring advances. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—A fair amount of business in Wire Nails is being placed with the mills, but the trade is placing orders very conservatively and only for actual needs, purchases being smaller in volume than at this time last year. There does not seem to be need of buyers anticipating requirements, as the mills are able to fill orders promptly, and there is no prospect that prices of Wire Nails will be any higher in the near future. As a rule prompt shipments are asked on orders being placed, this indicating that stocks held by jobbers are light. We are advised that regular prices are being absolutely maintained. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Cut Nails.—The movement of Cut Nails continues slow and in small quantities, for present requirements. Mills continue to cut down production to actual needs, but there appears to be no improvement in prices or demand. Concessions are being made on regular Steel Nail quotations, which are as follows: $2.05 base, per keg for carload lots at mill. Iron Nails generally should command about 10 cents more than Steel.

New York.—A comparatively light demand for Cut Nails characterizes the local market. Regular quotations are said to be adhered to by Nail houses, but it is reported that Hardware jobbers sometimes shade prices when other goods are sold. Quotations are on the basis of $2.30 per keg for small lots, at store.

Chicago.—In spite of the restriction of output by the mills demand lags behind supply. There is very little doing in the local market and jobbers' stocks continue adequate for all requirements. There is a hopeful prospect for a moderate degree of improvement when building operations become more active, and with a continuance of favorable weather there ought soon to be a decided betterment in the demand for Shingle Nails at least. Regular quotations are still being shaded 10 cents a keg or more. Chicago quotations are as follows: Iron Cut Nails, carloads, to jobbers, $2.38; to retailers, $2.43; Steel, to jobbers, in carloads, $2.28; to retailers, $2.33.

Pittsburgh.—There is no improvement, either in demand or prices, and the Cut Nail trade is very far from being in a satisfactory condition to the mills. Output is only about 30 per cent. to 35 per cent. of what it was at this time last year, while the trade is placing orders only for small lots and actual needs, not being disposed to anticipate requirements. It is claimed that Cut Nail mills that have to buy Steel Plate in the open market are not able to make any money on Cut Nails at present prices. The mills are endeavoring to hold prices and are cutting down output to meet actual requirements, but the jobbing trade is cutting more or less. We quote Steel Cut Nails at $1.90 to $1.95, f.o.b. Pittsburgh, for carload lots, and about $2 for small lots, to which freight to point of delivery is added. Iron Cut Nails are about $2.05, at maker's mill.

Barb Wire.—An improved demand is apparent, as weather conditions permit active work in Fence building. This is becoming more general in other sections than in the South, where consumption of Barb Wire has been in

evidence for some time. Buyers, however, are conservative in their purchases, not being inclined to accumulate large stocks. Prices are being maintained at regular quotations, according to information from the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—Fence building is now in general progress in nearly all sections of the country, and dealers' stocks are beginning to move freely. Encouraged by a liberal consumptive demand orders are coming out without hesitation, and a growing volume of tonnage is being booked by the mills. The outlook for a satisfactory business through the spring months is most promising. Prices are reported to be firm and unchanged. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The volume of business from the West and Northwest is reported to be increasing, while from the South it has been fairly active for some time. Consumers are not placing as large orders as at this time last year, being disposed to limit purchases to actual needs and not carry large stocks. The mills are able to make prompt deliveries, and there is no probability of higher prices for some time at least. We are advised that the market is firm, and that regular prices are being held. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—Early orders from manufacturers of Wire Fencing were not as large as at the same period last year, and increased consumption is anticipated from this source, while it is probable that orders will keep well within actual requirements. Mills are in a position to make prompt deliveries. Prices are reported as being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—Fence salesmen continue to report a growing demand, which in some parts of the country is not far behind that of last year. Having been very conservative in their purchases for anticipated requirements, it is not unlikely that Fence manufacturers will find it necessary to make material additions to their purchases. General firmness characterizes the market and prices are unchanged. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—A fair amount of new tonnage is being placed with the mills, but Fence manufacturers and other consumers are not disposed to anticipate requirements and are buying only such tonnage as their actual needs require. The mills are able to make prompt deliveries, and with no probability of any higher prices in the near future, there is no incentive for the trade to carry large stocks. We are advised that the market is firm, regular prices being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Table Cutlery.—Leading manufacturers of Table Cutlery have adopted a new schedule applying to Scale Tang goods by which their prices are established on a fairly uniform basis. The schedule is said to represent no important changes in ruling quotations, either in the way of advances or declines.

Padlocks.—As has doubtless been inferred by readers of *The Iron Age*, manufacturers of Padlocks have for several months been working in harmony, and prices have remained remarkably steady in the face of general market conditions. Competition has been decidedly sharp in the past and prices on some classes of Padlocks, principally in the cheaper grades, have been kept down to an unprofitable level. In an effort to correct this situation, the manufacturers have been at work for some time classifying their goods according to uniform standards and endeavoring to establish a basis by which the lines of different makers could be intelligently compared. This task was a difficult one, involving much time and labor as well as moderation, since mutual concessions were of course necessary, but it has finally been accomplished to the satisfaction of all. Although no attempt has been made to establish a uniform basis of quotations in the way of lists and discounts, a complete readjustment of prices has been effected, withdrawals of old quotations having been sent out on Monday of this week. The new prices of the different manufacturers are now being mailed. They represent little change in Padlocks of the higher grade, but there are numerous changes in cheaper goods, for the reasons already suggested. While advances are the more numerous, there are some declines, the ultimate result being to bring corresponding lines of the various makers into practically the same level.

Coil Chain.—Irregularity in prices, to which attention has frequently been called in these columns, continues to characterize the market for Coil Chain. No tendency toward improvement has yet been observed, and quotations currently reported establish a level on ⅝-in. Chain somewhat below $3.50 f.o.b. Pittsburgh. Although prices are so low buyers are showing little disposition to place orders beyond immediate requirements.

Chisels and Drawing Knives.—While some lines of Tools are fairly steady, at least on the surface, there has been considerable irregularity in Chisels and Drawing Knives for many weeks, and at the present time a discount of 80, 10 and 10 per cent. is easily obtainable.

Galvanized Ware.—It is announced this morning that leading manufacturers of Galvanized Ware have reduced their established prices 10 per cent. on regular Pails and Tubs and 5 per cent. on a few less important lines. The market for these goods has recently shown some irregularity, and the open cut does not come as a surprise to well informed members of the trade.

Linseed Oil.—Market conditions remain practically unchanged and demand is, for the most part, confined to small lots. Manufacturing consumers have purchased a few cars to cover immediate requirements. Stocks are generally light in the hands of manufacturers and buyers, which accounts for the firmness possessed by the market. Local quotations are as follows: In five-barrel lots, State and Western Raw, 40 to 42 cents; City Raw, 43 to 44 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The Savannah market continues firm at comparatively high prices, which are the result of other influences than demand. The new crop of Turpentine has begun to arrive at Southern points and there is consequently little confidence expressed that Savannah prices will continue at the present level. It is said an option has been taken on the independent tank supplies in the South. The New York market is represented by the following quotations: Oil Barrels, 56 to 56½ cents; Machine Made Barrels, 56½ to 57 cents. Locally demand is light.

Rope.—Manufacturers who are putting forth exertions to get business notice some improvement in demand. This has a tendency to be spasmodic rather than regular, varying considerably from day to day. The wisdom of buyers in not laying in large stocks of Rope early in the year is apparent, when the weak and low market for Hemp is taken into consideration. Fair current Manila Hemp is only ¼ cent higher than Sisal Hemp. The supply of both classes of Hemp is largely in excess of demand, owing to general trade conditions. The following quotations for base sizes fairly represent the market: Pure Manila, 10¼ to 11 cents; B quality grades down to 8 to 9 cents; Pure Sisal, 7½ to 8 cents; lower grades Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Window Glass.—Demand for Window Glass in the Central West shows a slight improvement, although carload buying is not general. In the Eastern section of the country demand continues light. In New York and vicinity business is light, and prices are more or less irregular. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single strength, 90 and 25 per cent.; double strength, 90 and 30 per cent. discount from jobbers' list. These prices are, however, not closely adhered to. It is reported that the Colburn sheet drawing machine is now in successful operation. This is a machine for the manufacture of Window Glass by a continuous sheet drawing process. It is explained that the use of the machine practically eliminates skilled workmen, doing away with the necessity of blowers, snappers, or flatteners, cutters being the only skilled labor required.

THE COMMONWEALTH OF AUSTRALIA AND THE DOMINION OF NEW ZEALAND.

Third Article.

BY JOHN L. SARDY.

IMPORTERS of American Hardware complain about the long time vessels from the United States take to discharge cargo. This does not apply to the first Australian port of call, but as these steamers stop at every port, of which usually the last one is Brisbane, it takes about two months after the vessel has arrived at the first port before the importer at the last port gets his goods. This not only hampers American trade, but also compels the importer to pay for the goods before he gets them, which, naturally enough, he does not like, and serves to send business to England and Germany which otherwise we would have.

One Port Steamer Calls.

What they would like to see is an American line of steamers going to alternate ports on one sailing and the other ports on the next, instead of stopping all along the coast. At the same time our trade with Australasia is not declining; the reverse is the case. A paragraph in one of the New Zealand papers is to the effect that "A steady increase in the importation of American goods is becoming a feature of local shipping. The local companies who act as agents for tramp lines agree that the expansion is unmistakable, though they are unable to give the cause."

American Files.

A few years ago importations of American Files were only about 20 to 25 per cent. of the total. From this the trade has grown until now it reaches about 60 per cent. In former times the English File makers put up their goods in paper parcels, labeled with pen and ink. The American manner of packing in neat pasteboard boxes with clearly printed labels in different colors for different cuts, forced the English makers to do the same, and now they tell their customers that their Files are packed according to the American method; but American Files hold the sway and are preferred to any other make.

Other American Goods in Large Demand.

Gun Metal Steam Fittings have also shown a large American increase in the last 10 years. Of course, American Tools and Machines, Locks, Hinges, &c., have to a considerable extent held the Australian market for years and a good trade also exists in American Household and Builders' Hardware, to say nothing of Axe, Pick and Shovel Handles and Agricultural Implements.

Although American Auger Bits are sold in Australasia the English made Mathieson Bit is the favorite for hardwood, on account of its coarse point and single twist. It has a large sale, the ½-in. size retailing for 1 shilling (24 cents) each.

As for Cutlery, the cheap sort is nearly all of German manufacture. The really good Cutlery is English, so it is said.

German Hardware Coming In.

Of late a lot of German Hardware has been coming into Australia, on account of steamship companies cutting rates, which were brought down as low as two shillings and 6 pence to 5 shillings per ton, instead of the usual rate of 25 shillings. At present the rate has risen, but it is still about half price, and German manufacturers are, and have been, benefiting largely, especially makers of Enameled Ware, Lamps and Lamp Chimneys, and other low priced bulky articles. At the same time an American Lamp Chimney has such a good name in Australia that it keeps on holding its own.

An English imitation of a well-known American Carpet Sweeper appears to be gaining a strong foothold. Perhaps the American maker had better wake up and push his Carpet Sweeper, which, after all, is what they are made for.

Anthony Hordern & Sons.

It is not the purpose of these articles to advertise by name any particular firm, but a short account of a mammoth business, conducted on the other side of the world, of which Hardware forms a considerable part, may not be amiss. Nearly 90 years ago a progressive young man with more brains than capital started a small retail place of business in Sydney. This was early in the history of the colony. The young man was Anthony Hordern, founder of the firm of Anthony Hordern & Sons, now being carried on by his grandson, Samuel Hordern, who has the ability of his grandfather, assisted by a capital said to be upward of £1,000,000 sterling. It is required in wages and salaries alone about £1000 per day to run this immense establishment, the business of which in proportion to the population catered to is stated to be the largest of its kind in the world. Dry Goods, Clothing, Hardware, Groceries, Furniture, Agricultural Implements, Wagons, Carriages—in fact, practically everything—can be supplied. The discovery of gold in 1851 gave the business a boom from which it has never receded, but has steadily advanced with the growth of the city.

It may be interesting to note that the rules and regulations of this enormous establishment are so well devised that one of our largest similar firms in the United States applied for a copy, which was gladly sent, and about two-thirds of them were adopted.

The total area covered by the building, courtyards and adjuncts exceeds three acres, and the total frontages to all streets, lanes and alleyways measure 2600 ft. All this in the Southern Hemisphere in a comparatively young city of only about 500,000 inhabitants!

The whole of the Pitt street end of the establishment is devoted to Hardware, Domestic, Builders', Horticultural and Household Fittings, Tradesmen's Tools, Electrical Accessories, Saddlery, Harness, Guns, and in fact every conceivable article in the Hardware and kindred lines. It is a gratifying fact to note that a good proportion of all this Hardware is of American manufacture, the firm's trade with the United States being a most extensive one. It is also noteworthy that the system of pneumatic cash tubes, said to be among the largest in the world, is American.

Samuel Hordern, owner of and presiding over this wonderful business, is by no means inaccessible, but on the contrary is a polite, affable gentleman who puts on no airs, thoroughly understands the secret of efficient organization, wastes no time himself and has imbued his managers with the same excellent business trait.

New York Exporters.

Nearly all the American business done in Australasia is through the New York export shipping firms, to whom due credit must be given for developing our trade in this lucrative market. The traveler representing American manufacturers rarely obtains an actual order. All in good time the business reaches the manufacturer through the commission house.

Rise in Real Estate.

To show the vast increase in real estate values a single instance will suffice. In the early fifties an English army officer was passing through Melbourne on his way to England. While waiting there for his ship the

first public auction sale of land took place, and as a flyer he bought a lot for which he paid £80, or about $400, and then left for England thinking no more about it. The years rolled on and Melbourne grew.

The family retained the title to the lot, which became the corner of Swanston and Collins streets, one of the finest business locations in Melbourne, on which now stands the Nicholson Building, bringing in to the English family a rental of £25,000 sterling, say, $125,000, per annum.

Charles Parker Company's Vise Catalogue

THE CHARLES PARKER COMPANY, Meriden, Conn., and 32 Warren street, New York, has just issued a finely illustrated descriptive catalogue, No. 5, of Vises and Ratchet Drills, covering 77 pages in an exhaustive line. This is in contrast with a four-page pamphlet issued over 50 years ago by the company, which then included the entire assortment. Vises are shown in many styles and sizes, for mechanics in metal and wood, and for use on automobiles. At the back are a number of pages, pricing, illustrating, describing and numbering the numerous parts of the Vises, to facilitate ordering for repairs. Facing the title-page is an illustration of the Parker factories at Meriden.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

READING HARDWARE COMPANY, Reading, Pa.: Catalogue and price-list of Reading Lawn Mowers, with and without ball bearings, in nine styles, with a total of 72 sizes, illustrated in *fac-simile* colors. The Mowers are made in 3, 4 and 6 blade styles, and hights of wheels are 8, 9 and 10 in.

GREGG HARDWARE COMPANY, Detroit, Mich.: Catalogue illustrating and listing an extensive line of Builders' Hardware, Tools, &c.

ROBERT J. MASBACH, 80 Vesey street, New York: Illustrated catalogue No. 15, referring to Peanut Roasters and Warmers, for charcoal, gas or gasoline fuel, Frankfurter Broilers, &c.

LEFEVER ARMS COMPANY, Syracuse, N. Y.: Illustrated catalogue of Shot Guns, describing details of construction, special features and advantages, and giving much information regarding care and handling of Guns, Loads, &c.; also salesmen's aid, telling how one of the company's Guns was sold by an expert salesman.

MATHER GAME COMPANY, Canton, Ohio: Illustrated circular referring to Mather's Parlor Baseball Game.

LINCOLN-WILLIAMS TWIST DRILL COMPANY, Taunton, Mass.: Illustrated catalogue and price-list of high speed Twist Drills.

CULLMAN WHEEL COMPANY, Chicago: Illustrated catalogue No. 6, referring to Spur Differentials, and automobile and machinery Sprockets and Chains.

LOUDEN MACHINERY COMPANY, Fairfield, Iowa: Illustrated catalogues referring to overhead Carriers for farm, store, mill and factory, and Perfect Barn Equipments, including Hay Carriers, Slings and Forks, Pulleys, Hangers, Cattle Stanchions, &c.

F. C. JOHNSON, Stillman Valley, Ill.: 1908 illustrated price-list of Neck Yokes, Steel Centers, Whiffletree Attachments, Bridle Bits, Anti-Rattlers, Quick Shifts and Coil Washers.

RELIANCE EDGE TOOL COMPANY, Youngstown, Ohio: Circular referring to Reliance Chisels, Gouges and Drawing Knives.

BOSTON WOVEN HOSE & RUBBER COMPANY, Cambridge, Mass.: General illustrated catalogue A 2, combining department editions and referring to an extensive line of rubber products, including Belting, Hose, Packing, Gaskets and Tubing, Mats and Matting, Fruit Jar Rings, Brushes, Insulating and Friction Tapes, Hose Goods, &c.

W. R. HARRISON & Co., Massillon, Ohio: Illustrated catalogues referring respectively to Tornado Tubular Silos and Feed and Ensilage Cutters, Carriers, Blowers, Land Rollers, Wheelbarrows, Farm Trucks, &c.

NATIONAL CUTLERY COMPANY, Detroit, Mich.: Attractive illustrated catalogue referring to Butcher Knives, Household Knives, Cold Chisels, Punches, &c.

LANE BROS. CO., Poughkeepsie, N. Y.: Illustrated catalogue of Joist and Timber Hangers, Door Hangers and Track, Tackle Blocks, Coffee Mills and Hardware specialties.

BAY STATE BRASS COMPANY, Haydenville, Mass.: Illustrated catalogue of Plumbers' Brass Goods and Sanitary Specialties.

TRADE ITEMS.

LEE & UNDERHILL, 35 Warren street, New York, manufacturers' representatives of sporting goods lines, such as Golf and Tennis goods, Roller Skates and kindred articles, have been appointed United States agents for the Gibson Band Forged Iron Golf Heads, manufactured by William Gibson & Co., Kingborn, Fife, Scotland, an old and representative house, well known in the trade. Lee & Underhill are also Eastern agents for the Rainbow Amusement Company, 192-200 Washington Boulevard, Chicago, Ill., manufacturing the Rainbow Roller Skate, recently put on the market and which has some novel features.

E. J. MARTIN'S SONS, Rockville, Conn., have issued an exceedingly attractive booklet referring to their Kingfisher brand braided silk fish lines. The cover of the booklet is embellished with an effective nature view in natural colors and between the inside pages of printed matter are a number of beautiful half-tone panel prints depicting fishing scenes.

ARTHUR PRATT, manufacturers' agent, Sydney, N. S. W., Australia, left that city on a visit to England and America on March 18, and should arrive in London about the end of April. Mr. Pratt's address in the British metropolis for a few weeks will be care of the Manager, Bank of New South Wales, 64 Old Broad street, London, E. C., where any communications from American manufacturers concerning Australian and New Zealand trade may be sent.

THE STRATTON LEVEL COMPANY, Greenfield, Mass., has issued an interesting folder, entitled "Valuable Hints on the Subject of Spirit Levels and Their Construction." Points on Level Glasses are gone into in some detail, including Machine Ground Van Hoesen Vials and the Cat's Eye Glass, which strikes the user like the eye of a feline in the darkness.

E. BISSELL & Co., Hardware auctioneers, 5 and 7 Mercer street, New York, announce an important trade sale for Thursday, April 9. The offerings will consist of a general line of Hardware, Tools, Garden Hose, Steel Goods, including Forks, Hoes, Rakes, &c., direct from and by order of the manufacturers. The goods are in store and ready for immediate delivery. They will be sold in quantities to suit the jobbing and retail trade. A descriptive catalogue relative to the sale will be ready April 4.

THE NETTLETON MFG. COMPANY, Middletown, Conn., has sold its business to the Starr Brothers Bell Company, East Hampton, Conn., which will manufacture the Nettleton Reversible Cutting Nippers under the style of Starr Nettleton Mfg. Company, at East Hampton, Conn.

A CONSOLIDATION has been effected of Meyer Hardware Company and E. M. Bush Hardware Company, both of Evansville, Ind. Additions and improvements have been begun in the latter store, which will be the headquarters of the new concern. E. M. Bush, the head of the company, is an ex-president of the National Retail Hardware Association, and has a wide reputation as an able merchant and an intelligent, aggressive worker on behalf of retail interests. The name of the consolidated concern is the E. M. Bush Hardware Company.

California State Retail Hardware Association.

THE seventh annual convention of the California State Retail Hardware Association was held at Reed's Hall, Oakland, on March 18, 19 and 20. President Frank T. Duhring, Sonoma, who has been in poor health recently, delivered his annual address at the first session at the close of which he was forced to retire. It was with much regret that the members saw him relinquish the chair for the remainder of the convention. M. M. Brown, San Francisco, second vice-president, handled the gavel at the other sessions.

Mayor F. K. Mott of Oakland delivered a felicitous address of welcome, in which he expressed his appreciation of the association's first visit to the "Athens of the Pacific," and reviewed the rapid growth of Oakland from a suburban town in 1906 to a thoroughly modern city of metropolitan aspirations and a doubled population in 1908. The Mayor explained that, although he made the beginning of his business career in the Hardware trade, he gave it up several years ago for the easier line of selling real estate, which has proved very profitable to many enterprising Oaklanders.

A. C. Rulofson, who left the Hardware trade about two years ago to take up the sheet metal line, becoming the first president of the Master Sheet Metal Workers' Association of San Francisco, made an interesting address on "Good of the Order." In his usual forcible and convincing style Mr. Rulofson showed the members the weak and strong points of associations and their work. Both his criticisms and words of advice were well received.

C. H. PHILPOTT.

F. B. DICKSON.

J. H. STEVES.

Wakefield Baker of Baker & Hamilton, whose subject was "The Relation of the Wholesaler to the Retailer, and Their Duty One to the Other," made an eloquent address, which was listened to with marked attention.

Another interesting address was that by F. J. Martin, secretary of the Northwestern Mutual Fire Insurance Association, Seattle, Wash., on the subject of "Mutual Insurance."

Resolutions of thanks were extended to *The Iron Age* for courtesies received at its hands, and also to the *Pacific Hardware Journal* and the *Hardware World* for favors rendered.

While no formal resolution was passed in opposition to parcel post legislation, it was the sense of the convention that the members should use all means in their power to defeat the proposed law, including personal influence and the writing of letters to Congressmen and Senators.

A very interesting and suggestive address on the "Benefits of Association Work" was delivered by Andrew Carrigan of the Dunham, Carrigan & Hayden Company, San Francisco, and president of the Pacific Coast Hardware & Metal Association. Mr. Carrigan, citing the 12 years' experience of the Pacific jobbers' association as an example, advocated the formation of local or sectional organizations in different parts of the State for looking after matters of purely local or limited interest, all to be affiliated with the larger body or State Association, which should confine itself to the broader questions and principles affecting the business as a whole. He pointed out that in this way much more effective work could be done on behalf of the retail Hardwareman and at no increased cost to him.

Secretary Dickson's Report.

Since our annual meeting, held in Los Angeles last March, the association, to some no doubt, has made very little progress. Still, at the same time it has done a great deal considering the conditions which it had to work under. Your association is no different from your business. Without the proper interest your business can never prosper. Without the proper interest your association cannot prosper. Your president cannot do it all. Your Executive Committee cannot do it all, and without the proper support your secretary's hands are tied.

The Cartwright law prevented the association from doing a great many things that had been mapped out, although we at that time were attempting to keep within the limits of the law. As soon as matters became a little more settled current prices that prevailed in San Francisco were sent to all the members. Since the first of November four of these cards have been sent to you, and had it been possible to have secured these current prices you would have received them all the year.

Quite a number of members have taken advantage of the mutual insurance plan, and were you to receive no other benefit from the association it would more than pay you to belong to the association.

Your office should have a rating on all of your customers, in other words, a record like that of a mercantile agency. This book to be confidentially kept under lock and key, so that when any of you had a new customer coming among you, you could get in communication with the State secretary's office and get a line on your man without taking any chances. This is being done very successfully in other associations. If things of this kind can be done you can have plenty of money to run your office successfully.

There are many ways of making money other than through price regulations, and one is by developing a kindly feeling for one another. The price question will then have a tendency to regulate itself. Your secretary is a firm believer in association work. One trouble with us business men is that we all seem to think it is the other fellow who is to blame for low prices, no profit, go-broke methods. We are very apt to attribute our failure to his unbusinesslike methods, while if we could stand before a mirror it might reflect something that would astonish us all. We must remember "the beam in our own eye" and then pluck the mote out of our competitor's eye.

The manufacturer, the jobber, the dealer and the farmer are all alike interested. Unless the jobber makes a profit, the manufacturer loses; unless the dealer succeeds, the jobber fails, and unless the farmer prospers, we all fail. The soil being the source of all our wealth

we must not ignore the farmer, who is the very essence and backbone of our prosperity.

Executive Committee Report.

We are now entering upon a new year and, we are glad to state, with several new features consummated during the year just passed, which are calculated to be of great benefit and interest to every member of the association who wishes to avail himself thereof. Primarily among these opportunities is that of Hardware mutual insurance. Arrangements have been completed during the year whereby members of this association are now enabled to secure their insurance through the association at a saving of 25 to 50 per cent. on their premiums. This subject will be taken up and discussed independently during the convention, and we sincerely hope that every Hardware dealer throughout the State will see that it is to his interest and advantage to become a member of this organization and thereby place himself in a position to take advantage of our insurance proposition.

The subject of insurance, we believe, will prove to be the future backbone of our organization. For the past two years your several Executive Committees have worked diligently in an effort to establish their own insurance company in the State of California. Existing legislation, however, makes this impracticable. Your committee has, therefore, succeeded in closing an arrangement with the Northwestern Mutual Fire Insurance Association of Seattle, Wash., whereby that company agrees to accept insurance from our members when applied for through our secretary, and on which insurance they guarantee to decrease your rate of premium to a figure ranging from 25 to 50 per cent.

Paints and Linseed Oil.

After reviewing the present arrangement existing between the wholesale dealers in Paints and Oils and the retail dealers in these lines, it was found that the existing differential of 2 cents per gallon on Linseed Oil and ¼ cent per pound on White Lead has been satisfactorily maintained by the wholesale dealers during the past year in all places throughout the entire State of California with the exception of San Francisco and Oakland.

The conditions existing in the two cities mentioned are understood to be such as to make the establishment of this differential impracticable. While this differential is not as great as might be desired by the retail dealers, we find that under the existing conditions it is as great as could be maintained; primarily owing to possible Eastern competition which would result from broadening the differentials as above mentioned. Under the circumstances we find that these differentials are for the present satisfactory, and it is suggested by your committee that the incoming Executive Committee, through its Paint and Oil Committee, confer with the representatives of the wholesalers in Paints and Oils, with a view to having the present arrangement continued and maintained.

It is further suggested that the wholesale dealers be requested to inform their representatives on the road of these differentials, so that they will be thoroughly familiar with the conditions existing in that they might properly respect and adhere to the same.

Wagons and Implements.

In connection with the matter of Wagons and Implements, the committee appointed at the last convention took up with the wholesale dealers in these lines, through Secretary Dickson, the subject of changing either the prevailing lists or discounts. It was the original preference of the wholesalers to allow the list prices to remain the same and to change the discounts to the trade. Secretary Dickson, however, succeeded in making the wholesale dealers realize that greater satisfaction and less distrust would result between the retail dealer and his customer by permitting the discounts to remain as heretofore, but raising and publishing a new list, showing the advance on Wagons made necessary by the increased cost of raw materials.

We believe that the matter of the present limited profit to the retail dealer is one for which he is entirely responsible. The close margins at which Wagons are sometimes sold we think to be due entirely to local conditions between dealers of the same or adjacent towns. This could and should be overcome or regulated by the retail dealers themselves through local association work. Provided no local association exists in your immediate vicinity or town at the present time, we most earnestly suggest and urge that the various dealers of each town or adjacent localities endeavor to get together among themselves for the purpose of a better general understanding toward the maintenance of prices.

Stoves and Tinware.

It was reported to the convention by the Executive Committee of one year ago that certain wholesale dealers in Stoves and Tinware were at that time doing a retail business as well. To the best of our knowledge these firms are still pursuing the policy of retailing. Furthermore, we find certain distributors of Stoves and Ranges, located both in San Francisco and Oakland, who have been selling their lines of Ranges among the second-hand dealers of these towns, much to the detriment of the legitimate dealers.

We most emphatically disapprove and condemn the action of any wholesaler in any line of goods either selling their wares to the consumer or to the second-hand dealer, and we unanimously recommend that each and every member of our State association take cognizance of the existing conditions and take such individual action as is calculated to show their displeasure and disapproval of such policy.

We further recommend that the Stoves and Tinware Committee of the Executive Committee be instructed to call upon and confer with these firms, as well as with those doing business with the second-hand dealers, and that this committee be empowered to make such final arrangements and recommendations best calculated to bring about the desired conditions, and that this association pledge itself to abide unanimously by the recommendations of its committee.

Pipe and Iron.

It is with much regret that we are obliged to report the present deplorable condition in the Pipe situation with reference to the jobbers handling that line of goods. Regardless of what the reasons for this condition may be, the fact remains that the upsetting of the former existing differentials between jobbers and legitimate retailers has taken from the latter the reasonable margin of profit to which they are entitled on this commodity.

We would therefore recommend that the subcommittee of the incoming Executive Committee whose duty it shall be to look after the Pipe and iron interests of this association be instructed to promptly take up with the wholesale dealers in Pipe this subject of demoralization in prices.

We further recommend that there be steps taken to promptly cause the re-establishment of the former differentials and to properly protect the retail dealer. We wish to place our stamp of disapproval on the present "open" market condition of this commodity.

The situation on Iron and Horseshoes appears to be quite satisfactory, and it is to be hoped that same will continue as at present.

Re-establishment of Local Associations.

Your Executive Committee fully realizes the unfortunate effect upon its sub-associations resulting from the suggested disbandment of the various local associations. We believe that the most benefit to the individual members in various sections of the State is returned to them through the existence of their local associations, no matter how small may be their membership or how limited the scope of their territory.

We wish to encourage the immediate re-establishment of all former local associations, so that they may be able to work out matters which are of special interest to them in their own localities, and who may be in position to take up with the State secretary from time to time any subjects which they themselves are not in position promptly or satisfactorily to handle and adjust.

It will be the aim of our secretary during the coming year to personally assist in the re-establishment and reorganization of local associations as herein outlined.

While we are given to understand that the parcel post bill is not likely to pass Congress at this session, the matter should nevertheless not be neglected by the members of this association. Our secretary has during the past year addressed letters to each Senator and Representative in Congress from the State of California, and has received replies from all stating that they were in favor of and would report the contentions of our association. Nevertheless, it behooves each and every one of us to continue our interest in the defeat of this proposed law and to do all in our power to prevent its final passage.

The Outlook in Hardware.

A. W. Scott of the Pacific Hardware & Steel Company, San Francisco, made an address on "The Outlook for the Hardware Business for 1908," from which we make the following extracts:

We all know what has taken place the last four months, or what originated in about October; I refer to the financial stringency in the money market, caused primarily, at least in a great degree according to a great many people, by overspeculation in Wall Street, as well as overspeculation in other parts of the country.

I suppose if the Wall Street magnate had been a little closer to the Western farmer he probably would not

have overspeculated quite so much. I think that is equally true of the wholesale merchant; if he stayed a little closer to home, and the people he is dealing with, he would not be so apt to overspeculate. It seems to me to be a time when all conservative merchants

Should Go a Little Slow.

All consumers are economizing, and that economy naturally affects all the merchants, wholesale and retail. Not long ago there was a gentleman in our store who talked about having just placed an order for a carload of goods. I asked him what he thought of the market; he said he did not know. I told him that I thought it might be well to look into the matter before placing any large orders; that usually we bought of this commodity from 250 to 500 tons per month, but that we had just placed an order for only about two cars. He was surprised.

I think it is certainly a time when every buyer should economize. It is a good time for him to collect his bills. There is no time like the present for collecting accounts.

As to the volume of business for the coming year, I don't think we need give ourselves any great anxiety on that account. The State of California is certainly very prosperous. We in San Francisco have been more affected by the financial stringency of the past four months than you in the country. We were going pretty rapidly ourselves. Rebuilding was going on to a great extent. The reaction was much greater with us than in the interior.

The prospects are for a good crop. If we have a fair amount of rain between this and May 1 we are pretty sure of good crops; in fact, that is pretty true of all the Western country, and especially true of the Pacific Coast. To resume normal conditions after going through what we have is naturally slow, but, as far as I can judge, we have nothing to fear. Business will gradually get back to a normal condition. We must all bear in mind that the conditions preceding the panic were abnormal conditions.

Decline in Prices Looked For.

There is one thing that I think we can all congratulate ourselves on: There has been no radical decrease in prices. That there will be a decrease in prices I do not doubt; in fact, I do not think there can be a question of doubt but this will be the case, but if prices come down gradually there need be no serious loss on this account. With staple goods prices have been steady for the last four months; there has been no marked decrease in these prices in the State of California and on the Pacific Coast.

While it may take a year or two years to reach a normal condition we are bound to reach it; you cannot have hard times when you have good crops and fair prices. The State of California has had abundant crops, and the signs are that we will have another good year, and we are having a large number of people coming into our State every day. I believe that the records of the Southern Pacific and the Santa Fé railroads show that more colonists have come into the State this year than in any preceding year, which is certainly a good sign.

Election of Officers.

The following officials were chosen for the ensuing year:

PRESIDENT, George H. Smith, Oakland.
FIRST VICE-PRESIDENT, C. H. Philpott, San Francisco.
SECOND VICE-PRESIDENT, J. H. Steves, St. Helena.
THIRD VICE-PRESIDENT, H. E. Humphrey, Whittier.
SECRETARY-TREASURER, Frank B. Dickson, San Francisco.

EXECUTIVE COMMITTEE: John P. Maxwell, Oakland; F. A. Rittigstein, Oakland; Geo. M. Hickman, San Francisco; I. C. Walker, San Francisco; Fred Fisher, Fresno; R. Barcroft, Merced; Henry Guiot, Los Angeles; John W. Baxter, Watsonville; J. C. Mailer, Santa Rosa; W. J. Boschkin, San Jose; W. C. Barth, Corona; R. O. Kimbrough, Sacramento.

Entertainment.

The programme of entertainment included a sightseeing trolley ride and luncheon for the 90 ladies, as guests of the Oakland Chamber of Commerce, on Thursday morning, and a theater party in the evening for members and their ladies at Idora Park. Special cars conveyed the guests, leaving the Hotel St. Mark at 7.30 p.m. for Oakland's famous amusement resort. There was also a banquet for the members and guests at Reed's Hall on Friday night. On Saturday a trip was made to the Pacific Steel & Wire Company's plant at East Oakland. All of the Hardware stores in Oakland were visited in the afternoon. The very efficient Entertainment Committee consisted of Frank A. Rittigstein, chairman; Geo. H. Smith, John P. Maxwell, Fred A. Osborn, Walter Meese, LeRoy R. Smith.

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TRIBUTE TO PHILIP CORBIN.

IT will be recalled by our readers that at the recent annual meeting of P. & F. Corbin and the Corbin Cabinet Lock Company, Philip Corbin declined to accept re-election as president of these corporations, continuing, however, as the head and president of the American Hardware Corporation. This action was taken by him with a view to escaping some responsibilities, because of his advanced age, and at the same time of promoting younger men to more important positions. At a meeting of the directors of these companies a committee was appointed to draft suitable resolutions. This committee reported the present week, recommending the following minute and testimonial, which were unanimously adopted by the directors as expressive of their high appreciation of Mr. Corbin:

At the annual meeting of the stockholders and directors of the Corbin Cabinet Lock Company, held February 17, 1908, Philip Corbin, president of the company for many years since its organization, in graceful relinquishment of the arduous duties of such office, declined re-election, and we, his associates on the Board of Directors, for ourselves and for the stockholders of the company, desire to place on record a testimonial expressing our hearty appreciation of the magnificent service rendered by him during the years that have passed.

In the early history of the company, during its financial struggles for existence, Philip Corbin was a giant of strength and a leader; in fact, we may say that the very existence of this corporation is due to the help, guidance and direction which he gave it in every way since its formation.

With such support founded on genius, integrity and executive ability, the success of the company has been amply assured, and we who are interested with Mr. Corbin in this enterprise, deem it a privilege and honor thus to express our obligation and appreciation:

A Testimonial to Hon. Philip Corbin.

Philip Corbin, president of this company since 1878, desiring to give more attention to the comprehensive affairs of the American Hardware Corporation, and to give recognition to the services of those so long associated with him in the conduct of the affairs of this company, declined a re-election as president at the annual meeting, held February 17, 1908. We, his friends, associates and admirers, avail ourselves of this opportunity to express in writing, and have made a part of the records of the Board of Directors of this company, our appreciation of his great usefulness and his great worth.

Few men witness, as he has done, the growth from an humble beginning to gigantic proportions of such an industry as that of which he is the active and honored leader.

Not many find time or opportunity while engrossed in building up and directing a great industrial enterprise to render helpful service as he has done to his neighbors, his city and his State.

Few are so fortunate as to win and retain the respect and confidence of associates and competitors alike throughout a strenuous business career of more than half a century.

In the midst of business perplexities and anxieties, to which Mr. Corbin has been no stranger, his sagacity has solved problems, his magnetic influence has healed dissensions, his courage has inspired others, his leadership has turned defeat into victory, and in all such experiences his honor and integrity have stood the test of the most exacting standards.

No man has challenged adversity with a more cheerful humor and none has enjoyed prosperity with more grace, humility and dignity.

We, who for many years have been intimately associated with this admirable man, have been benefited by his grand personality, have been inspired by his example, and instructed by his wisdom, believe this is a fitting time to testify for ourselves and for many others to those qualities of mind and heart which have made Philip Corbin the first citizen of New Britain.

Hardware Club of New York.

AT the annual meeting of the Hardware Club of New York, held at the club rooms, March 21, the following were elected to the Board of Governors for three years: Joseph Gales, George H. Sargent, Arthur G. Sherman, Edward Stagg and Edward C. Van Glahn. Subsequently the Board of Governors held a meeting, on March 24, and re-elected the following officers: President, Eugene Bissell; vice-president, Thomas F. Keating; treasurer, Alfred D. Clinch; secretary, Arthur G. Sherman.

The past year has been an eminently successful one with the club, thus continuing the fine record which has been made by it from the first. Its prosperity is indicated in the fact that there is so long a waiting list that resident members have to wait from 12 to 15 months for admission. There is, however, an opportunity still for a few nonresident members, who can be admitted promptly.

National Retail Hardware Association.

NINTH ANNUAL CONVENTION.

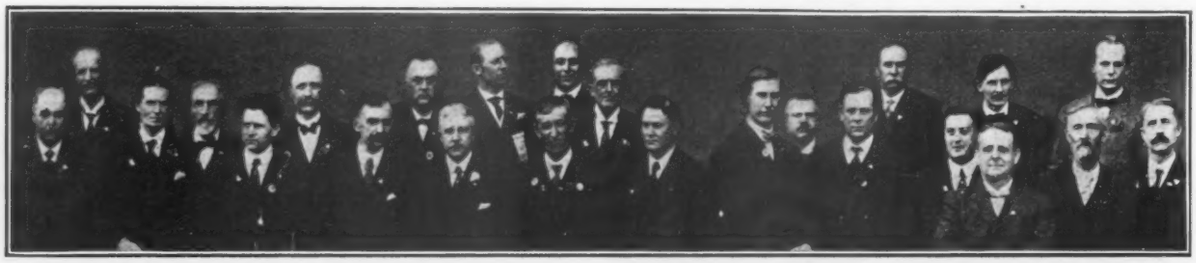
THE promise of a profitable, pleasurable and successful meeting, which was foreshadowed in the preliminary report given in last week's issue of the opening on Tuesday, March 24, of the ninth annual convention of the National Retail Hardware Association at St. Louis, was fully realized in the subsequent proceedings of this body, held on March 25, 26 and 27. A superior record of attendance was established in that nearly all of the

delegates present responded to the roll call at each of the sessions, which were convened promptly at the appointed hour.

The session on Wednesday morning was occupied with addresses upon various phases of association work, delivered by speakers officially connected with allied organizations. C. W. Asbury, president, American Hardware Manufacturers' Association, spoke of the related interests of manufacturers and distributors and the helpful advantages to be derived from mutual co-operation in organized effort. He was followed by W. S. Wright, president, National Hardware Association, who representing the jobbing interests, referred to the better understanding that had been established between the wholesale and retail trades through the influence of their respective associations which are, as they should be, general clearing houses for the adjustment of any differences that may arise.

A stirring address, delivered by George H. Maxwell, on "National Problems," dealt with the physical ruin that must surely follow the rapid deforestization of the country and social and moral questions involved in the growing congestion of population in large cities. The

force and fiery eloquence with which the speaker portrayed the cause and effect of these evils, together with the remedies proposed to counteract them, held the audience in rapt attention. Enthusiastic and prolonged applause followed the conclusion of Mr. Maxwell's address. The remaining sessions of the convention were principally executive, being devoted to the intimate business of the association.



Management of the Convention.

Too much praise cannot be given to President Miles and his associates for the skill and wisdom shown in the direction of the convention. The administration of the retiring president has been very successful and exceedingly creditable. The meetings during the three days of the convention, several of which were open to the public, were well attended and began with commendable promptness. The principal executive sessions were attended by an unusual proportion of the delegates. It was not found necessary to hold the meeting on Friday forenoon, as laid down in the programme, the business of the association having been finished up Thursday afternoon. Meetings of the secretaries and of the Executive Committee were, however, held, giving attention to some matters connected with the future working of the association.

Hardware Insurance.

Mutual Hardware insurance was a prominent topic in the convention. The reports from the various companies were regarded as eminently satisfactory, but there was the manifestation of a conservative disposition in order to keep this mutual Hardware insurance on a safe basis. It was pointed out that it might be a wise policy for the companies to be conservative in the distribution of dividends until there is the accumulation of a substantial surplus, which will be a safeguard against possible disaster in the future.

Territorial Divisions.

In accordance with the suggestions of Secretary Corey measures were taken to subdivide association territory, as follows, making four divisions—Western, Central, Eastern and Southern:

WESTERN: North and South Dakota, Nebraska, Colorado, Iowa and Minnesota.

CENTRAL: Wisconsin, Indiana, Illinois, Kentucky, Missouri, Michigan and Ohio.

EASTERN: Connecticut, New England, New York, Pennsylvania and West Virginia.

SOUTHERN: Arkansas, Oklahoma, Mississippi, Alabama, Tennessee, Carolinas and Georgia.

The plan is for the officers of the State associations in these divisions to arrange the schedule so that exhibitors, speakers and representatives of the National Association may visit at least two conventions a week. This would certainly promote the convenience of outside parties who may desire to attend several conventions.

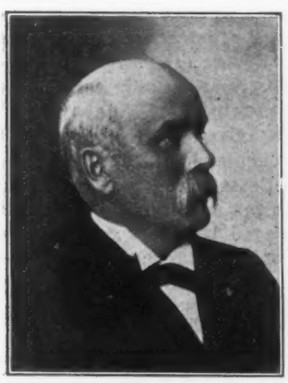
Meetings of the Secretaries.

Perhaps the most important practical work connected with the St. Louis meeting was done by the secretaries as the result of their conferences with one another. The action taken by them in regard to the dates of the annual conventions in the various States was especially important. It was recognized throughout the convention that to the secretaries belong a large measure of the credit for the success which attends the various State associations and the opportunity given to them to compare notes in regard to methods was admirably improved. This coming together of men prominent and influential in the association movement will doubtless result in the more wide adoption of the most approved methods as well as in the developing of a continued and possibly increased enthusiasm all along the line. These conferences were under the direction of Frank A. Bare of Ohio.

The Catalogue House Question.

Much less attention than heretofore was given to the catalogue house question, the policy of the association being not to make this a prominent subject of discussion. While there is much inconvenience still suffered by the merchants on account of the mail order business which is done with their customers, the disposition on the part of the trade generally is to accept the situation and make the best of it, some merchants indeed finding that by proper management of their own business they can greatly diminish the trade of the catalogue houses in their territory. The Joint Committee which was efficiently represented by E. M. Bush and A. H. Abbe, reported in regard to its work. The convention was thus

advised as to the views and aims of the committee in their efforts to conserve the interests of the regular distributers. The extent to which manufacturers are cooperating with the merchants as they either refuse to sell the catalogue houses or endeavor to control the prices at which their goods are sold is a gratifying feature of the situation. It is evident, too, from reports made that the mail order business has suffered a good deal of late as a result of the depression, while one of the great houses especially has lost, it is thought, many friends because of inferior quality of goods sent out.



A. T. STEBBINS.

S. R. MILES.

Resolutions.

Among the resolutions passed by the association are those given below. It will be observed that they cover a wide range of subjects, some of which have not been at all prominent in the discussions of the State associations and in regard to the wisdom of which there may be some difference of opinion:

Whereas, There is now pending before the United States Congress certain bills of great public interest, and their enactment into laws would be beneficial and of direct benefit to each and every State; and

Whereas, We believe that our Senators and Representatives in Congress desire to know what the sentiment and opinion of the people are upon the several bills now under consideration, so that they may act in harmony and intelligently on the questions; therefore, be it

Resolved, That the National Retail Hardware Association, representing 35 States, in convention assembled in the city of St. Louis, the 26th day of March, 1908, do hereby place themselves on record as unqualifiedly in favor of the enactment into laws of the following bills now under consideration, for we believe that they are laws necessary for growth, prosperity and development of the United States:

A National Pure Paint Law.
A National Pure Seed Law.
A National Good Roads Law.
A National Development of Atlantic and Inland Waterways.
For the Better Preservation of Our Forests.
For Honesty in Advertising.

And be it further Resolved, That we as a National Association of retail Hardware merchants stand against any and all legislation by Congress tending to a centralization of business or a curtailment in any way of the growth and development of our smaller cities and towns and our agricultural communities.

Resolved, That the secretary be directed to forward to each member of Congress a copy of this preamble and resolution.

Resolved, That the National Retail Hardware Association desires to express their sincere thanks to the jobbers and manufacturers and their ladies of St. Louis for and their appreciation of the cordial, generous and magnificent reception, entertainment and courtesy tendered and accorded the officers and delegates attending this convention and the ladies who accompanied them during their visit to this city. We wish to assure them that our visit will be one of our most pleasant and happiest recollections. We confidently believe our convention in St. Louis will result in promoting closer, stronger bonds of sympathy and trade interest between the manufacturer, the jobber and the retail merchant; be it further

Resolved, That our secretary be directed to send to the jobbers and manufacturers of St. Louis a copy of the above resolutions.

Resolved, That the National Retail Hardware Association desires to extend their hearty thanks to all the speakers who addressed the convention; and

Resolved, That the National Retail Hardware Association wish to extend to the St. Louis press and the trade press their thanks for the full and fair report which they have given of the proceedings of this convention.

Resolved, That the National Retail Hardware Association extend their thanks to the manufacturers and jobbers of this country who have recognized the justice of our position that it is unwise to sell their products to other than those who are recognized Hardware merchants.

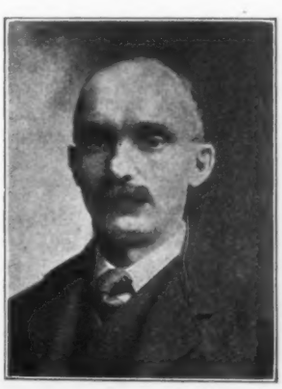
Delegates Present.

The following delegates representing the different State bodies affiliated with the national association were in attendance:

ALABAMA.
L. G. Smith, Ensley.
CAROLINAS.
F. W. Dixon, Charlotte, N. C.
GEORGIA.
H. C. Briggs, Valdosta.
ILLINOIS.
T. J. Mathews, Mt. Vernon.
L. D. Nish, Elgin.
J. H. Vawter, Salem.
F. Geissing, East St. Louis.
O. H. Howe, Streator.
Geo. A. Englehart, Chicago.
James Gormley, Chicago.
Wm. Bittel, Peoria.
Thos. E. Connors, Evanston.
Chas. Zumbrock, Springfield.
INDIANA.
W. C. Ott, Rockville.
H. R. Culbertson, Auburn.
W. M. Hunter, Versailles.
H. G. May, Shirley.
J. T. Gardner, Scottsburg.
M. L. Lewis, Marion.
A. Reichenbach, Huntington.
IOWA.
P. C. De Vol, Council Bluffs.
A. R. Sale, Mason City.
J. F. Doty, West Liberty.
L. C. Abbott, Marshalltown.
C. E. Haas, Le Mars.
H. S. Vincent, Fort Dodge.
C. T. Gadd, Des Moines.
T. N. Peterson, Council Bluffs.
KENTUCKY.
John W. Reid, Hodginsville.
J. M. Stone, Sturgis.
MICHIGAN.
C. M. Alden, Grand Rapids.
A. J. Scott, Marine City.
MINNESOTA.
A. Marckel, Perham.
J. Schmidt, Wabasha.
C. F. Ladner, St. Cloud.
C. W. Bouck, Royalton.
D. H. Evans, Tracy.
C. H. Casey, Jordan.
W. H. Tomlinson, Le Sueur.
M. S. Mathews, Minneapolis.
J. H. Smith, Minneapolis.
MISSISSIPPI.
T. H. Baird, Greenwood.
W. E. Biggs, Crystal Springs.
MISSOURI.
G. A. Pauly, St. Louis.
O. W. Johnson, Marshall.
F. D. Kansteiner, St. Louis.
NEBRASKA.
Dan Kavanaugh, Fairbury.
J. Frank Barr, Lincoln.
Max Uhlig, Holdrege.
M. D. Hussie, Omaha.
Geo. R. Wycoff, Madison.
H. J. Hall, Lincoln.
NEW ENGLAND.
Ernest L. Davis, Boston, Mass.
S. H. Thompson, Lowell, Mass.
Frank E. Peirson, Pittsfield, Mass.
NEW YORK.
L. J. Ernst, Rochester.
J. Holley Bradish, Batavia.
J. G. Ferres, Johnstown.
A. E. Towne, Saratoga Springs.
NORTH DAKOTA.
W. R. McIntosh, Bottineau.
J. S. Cole, Lisbon.
C. N. Barnes, Grand Forks.
OHIO.
W. P. Bogardus, Mt. Vernon.
G. M. Gray, Coshocton.
H. C. Wiseman, Springfield.
W. L. Jacobs, Youngstown.
J. S. Spoerle, Hamilton.
Frank A. Bare, Mansfield.
OKLAHOMA.
O. A. Smith, Watonga.
PENNSYLVANIA.
J. F. Howe, Freedom.
A. H. Kauffman, Lock Haven.
W. P. Lewis, Huntingdon.
SOUTH DAKOTA.
E. Gregory, Alexandria.
H. E. Johnson, Redfield.
TENNESSEE.
L. D. Love, Nashville.
M. A. Walker, Covington.
WEST VIRGINIA.
Leslie Hawker, Shinnston.
WISCONSIN.
Jas. Murphy, Racine.
H. F. Krueger, Neenah.
C. A. Peck, Berlin.
R. C. Murdock, Beloit.
John Hessel, Antigo.
Emil Teitgen, Manitowoc.
H. C. Scofield, Sturgeon Bay.

Election of Officers.

Careful attention was given to the selection of officers for the coming year, and the Nominating Committee, under the chairmanship of C. F. Ladner, recommended the choice of the following, who were unanimously chosen:



C. H. WILLIAMS.

H. L. McNAMARA.

PRESIDENT, A. T. Stebbins, Rochester, Minn.

FIRST VICE-PRESIDENT, C. H. Williams, Streator, Ill.

SECOND VICE-PRESIDENT, H. L. McNamara, Janesville, Wis.

TREASURER, F. A. Bare, Mansfield, Ohio.

EXECUTIVE COMMITTEE: Nathan Roberts, Omaha, Neb.; J. G. Ferres, Johnstown, N. Y.; L. C. Abbott, Marshalltown, Iowa; F. Alex. Chandler, Boston, Mass.

To these should be added the name of M. L. Corey, who will, of course, continue as secretary, a position which he has filled with distinguished ability and success.

The peculiar fitness of these gentlemen for the positions to which they have been called will be recognized

by all who know them. A. T. Stebbins, the new president, from his familiarity with public affairs and deliberative assemblies and his experience, especially as State Senator, give him qualifications which admirably supplement his ability and position as a merchant who has from the first been prominent and influential in association work. The vice-presidents, C. H. Williams and H. L. McNamara, have also been long identified with the association movement and are entitled to the promotion which thus comes

M. L. COREY.

FRANK A. BARE.

to them. The new treasurer, F. A. Bare, has made a notable record as State secretary, and his influence in his new position, which will not interfere with the invaluable work he has been doing in his own State, should be felt in the direction of the affairs of the national body. The members of the Executive Committee will be recognized, too, as men of broad views and ability, whose counsels must be of value. The association is certainly to be congratulated on having such a board of officers.

Next Meeting.

By a unanimous vote Milwaukee was chosen as the place of the next meeting. It will be remembered that that city had been practically decided upon at Boston as this year's meeting place for the association, but that at the last it was determined to accept the very cordial invitation to St. Louis.

Entertainment Committee.

The Entertainment Committee consisted of representatives of the following manufacturing and jobbing interests of St. Louis:

Ætna & American Powder Mills.
American Steel & Wire Co.
E. C. Atkins & Co.
Beck & Corbitt Iron Co.
Bridge & Beach Mfg. Co.
Buck's Stove & Range Co.
Charter Oak Stove & Range Co.
John Deere Plow Co.
Dupont Powder Co.
Fairbanks, Morse & Co.
A. Geisel Mfg. Co.
Geller, Ward & Hasner Hardware Co.
C. Hagar & Sons Hinge Co.
Hoyt Metal Co.
International Harvester Co.
Jackes-Evans Mfg. Co.
Kent & Purdy Paint Co.
Kingman-St. Louis Implement Co.
Ludlow-Saylor Wire Co.
Majestic Mfg. Co.
W. C. Manley Implement Co.
Missouri Glass Co.
Mound City Paint & Color Co. and Gregg Varnish Co.
Murphy Varnish Co.
National Enameling & Stamping Co.
National Lead Co.
Norvell-Shapleigh Hardware Co.
Oliver Chilled Plow Works.
Parlin & Orendorff Co.
Platt & Thornburgh Paint Co.
Ringen Stove Co.
St. Louis Shovel Co.
Simmons Hardware Co.
Sligo Iron Store Co.
E. E. Souther Iron Co.
Standard Stamping Co.
Vane-Calvert Paint Co.
Western Iron & Supply Co.
Wheeling Corrugating Co.
Witte Hardware Co.

Entertainment.

That the forceful spirit of modern commercialism which has contribted so much to the splendid industrial development of St. Louis can be harmoniously blended with the typical ideals of Southern hospitality was most happily demonstrated in the delightful series of entertainments provided for the delegates and guests of the convention. Some feature of enjoyable interest was arranged for every unoccupied moment and every possible attention that could in any way contribute to the pleasure of those in attendance was shown by the Committee on Arrangements in particular and the St. Louis Harwaremen in general. A mileage book, as illustrated herewith, "good for a continual round of pleasure" and inclosed in a handsome seal leather pocketbook, was issued to each guest, which, besides specific information regarding the places of chief interest in the city, contained coupon tickets for each of the several diversions planned for the occasion. These included a theatre party at the Olympic Theatre on Tuesday evening; a matinee for ladies in the afternoon, followed by a reception and social gathering in the parlors of the Planters' Hotel by the officers of the National Retail Hardware Association to the delegates, St. Louis friends and ladies, on Wednesday evening; a banquet at the Planters' Hotel, on Thursday evening, and a carriage drive for delegates and ladies through the city and parks on Friday afternoon. In addition to this comprehensive programme the ladies in attendance were delightfully entertained on Tuesday and Wednesday at club luncheons given by the Simmons Hardware Company, Norvell-Shapleigh Hardware Company and the Witte Hardware Company.

Too much cannot be said in praise of the painstaking care, tact and judgment displayed by the special Committee of Arrangements, not only in the comprehensive scope of its plans, but the admirable way in which they were carried out. This committee consisted of H. B. Gordon, secretary Norvell-Shapleigh Hardware Company; F. J. Semple, vice-president Simmons Hardware Company; F. A. Witte, secretary Witte Hardware Company. The numerous expressions of gratification voiced by members of the convention bore eloquent testimony of the recipients' appreciation of the cordial hospitality enjoyed at the hands of St. Louis Hardwaremen and their ladies and the allied trade interests of the city.

While the hospitality was exceedingly warm and cordial in its spirit and the manner in which it was manifested, the Hardware interests of the city are to be congratulated on the care and skill with which all details were planned and carried out. It is safe to say that the city and its merchants and manufacturers made many friends in view of the reception extended the visitors.

The Banquet.

The guests who were fortunate enough to be present at the splendid banquet given by the jobbers and manufacturers of St. Louis in the main dining room of the Planters' Hotel on Thursday evening, enjoyed not only a sumptuous repast but were entertained by a number of excellent after dinner speeches. Under the tactful man-

O. H. WITTE.

agement of James E. Smith, officiating as toastmaster, every moment occupied by the programme was filled with interest and the presentation of speakers was conducted in a most happy vein.

Speaking as a representative of the mayor, Saunders Norvell contrasted modern municipal conditions and customs with those of the Medieval Ages, when the cities were walled and guarded by locked gates. At the conclusion of his remarks, which terminated with a reference to the old time custom of presenting the keys of the city to visiting guests, a blare of trumpets was heard outside the hall; immediately there entered a page, followed by a retinue of courtiers all gorgeously costumed, bearing a huge wooden Key on a satin pillow which, after a stately march about the banquet hall, was ceremoniously deposited before President Miles. This inci-

dent being unannounced came as a complete surprise to the assembled guests and because of the happy manner in which it was conceived and carried out was highly appreciated.

The principal address of the evening was delivered by Gov. Jos. W. Folk of Missouri, who spoke with telling effect upon State and civic problems involved in the suppression of political corruption. Knowledge of his achievements in the successful assaults conducted by him against bribery and graft lent peculiar significance to his words, which rang with the expressed conviction of an awakening of the public conscience. Short speeches by President S. R. Miles, Henry T. Kent, W. S. Wright and Julius C. Birge added to the zest and pleasure of the occasion, which was conceded to be one of the most brilliant and delightful in the history of the association.

As a concluding feature of the banquet there was the awarding of prizes. Dispensing with the formalities usual to such occasions, the toastmaster announced the winner of the prize for gentlemen to be Secretary M. L. Corey, who was forthwith tendered a full spool of Barb Wire, which he accepted as peculiarly described on account of its Hardware points. The ladies' prize was awarded to Mrs. S. R. Miles, who in acknowledgment of the Washboard that was presented to her responded to the sentiment expressed by the toastmaster in phrases as graceful and felicitous as they were impromptu.

S. R. MILES' PRESIDENTIAL ADDRESS.

The address of S. R. Miles, president of the association, was an interesting and elaborate presentation of matters having direct connection with the work of the national organization and the various State bodies, and was listened to with close attention. Mr. Miles remarked that the holding of the last annual convention in Boston in June, three months later than the usual dates, had made the official year just closing a short one in point of time, although it was long in the way of events. Referring to the business disturbance which made itself felt during the closing quarter of the year, Mr. Miles said:

The incipient panic during the closing months of the year, precipitated apparently from a clear sky, brought to the business world many anxious moments. But, having ridden so long upon the top wave of prosperity, the legitimate business public refused to down, and by sheer faith alone averted a repetition of the panic of 1893—faith not only in each other, but faith to believe that aside from a speculative tendency in some quarters the business of the entire country was on a sound, legitimate basis; faith in our monetary system; faith in the Government; faith in the executive ability of that type of American citizenship as exemplified in Theodore Roosevelt, and faith to believe the people can be trusted to elect, as his successor, one from among their citizens who will continue the campaign so ably inaugurated by the President against the many evils that have crept into and menaced the very foundations of the Government.

With the beginning of the new year the atmosphere had very materially cleared, and in spite of the usual Presidential year "bogie man," 1908 promises well in a business way. In an association way, too, the past months have been eventful.

Mr. Miles then referred to the experiences of the South Dakota Retail Merchants' Association, the Northwestern Lumbermen's Association, and other bodies in combating the competition of catalogue houses, and the suits brought by these houses against the associations as a result of their activities, which, as the trade is aware, were decided against the mail order concerns.

Mail Order Business.

Alluding to the volume of mail order business and especially the trade in Hardware and kindred lines, Mr. Miles spoke as follows:

Enormous as the mail order business seems to be, reliable information develops the fact that in the Hardware and kindred lines less than 1 per cent. of the business is handled by mail order houses; or, in other words, more than 99 per cent. of all the Hardware business is handled through members of this association and the retail Hardware merchants still outside the fold. The bone of contention is not the volume of business done by mail order houses.

The volume of business transacted by some of the larger mail order concerns is unquestionably greater than that of any individual retail Hardware merchant anywhere, and this is where organization has borne fruit. We have been able to say to the manufacturer and jobber, and with reason, that it is unfair to put the retail mail order concerns, that are admittedly selling only 1 per cent. of their output, in a position to name the price at which the other 99 per cent. must be sold. Is that in restraint of trade? What court of justice could, by any stretch of imagination, place any such construction upon it?

Upon such argument has our work been based. As an evidence of this, let me quote you from a letter written

Mileage and Entertainment Book.

only a few days ago by a well-known manufacturer that decided to discontinue all relations with mail order concerns:

And, as you are aware, no pressure has been brought to bear upon us other than the intelligent presentation of the Hardware side of the case, by our friends in the Hardware Association.

Whole volumes might be written without paying a higher compliment to the work of the National Retail Hardware Association and the affiliated State associations than is contained in the above quotations.

Parcel Post.

He then discussed the parcel post compaign of Postmaster-General Meyer at considerable length. He said he had attended conferences of various trade organizations in Chicago in December, called for the purpose of looking into the situation and devising ways and means of defeating any measure of the kind at the present session of Congress. A very thorough discussion of the subject was had, and while it seemed to be the concensus of opinion that there would be no legislation of this character enacted at the present session, it was decided to inaugurate a campaign of education that would place the whole subject fairly and squarely before the people, thus giving them an opportunity to study and decide the question intelligently and on its merits. Mr. Miles continued:

One of the best ways to get this information into the hands of the farmers and retail merchants of the country, who are supposed to favor a domestic parcel post because the Postmaster-General says it is entirely in their interest, is by placing the literature in the hands of your local editors. I would advise that in doing this you suggest to these editors that they secure from the Postmaster-General all of the literature that he has published on this subject, which may be had for the asking, and that they study both sides of the question. I am very sure that the outcome of this investigation will be the appearance of strong editorials in opposition to any plan as yet proposed by the Postmaster-General.

Association Spirit.

Referring to his attendance at recent meetings of the State associations and the impressions made upon him thereby, he said:

It was my pleasure to attend the recent meetings of the North Dakota, Iowa, New York, Ohio and Missouri State associations. Everywhere was I impressed with the splendid spirit of loyalty and enthusiasm that prevailed. Questions vitally affecting not simply the business of the retail Hardware merchant, but retail business of every kind and character, were taken up and handled without gloves, and yet handled in a fair, clean, conservative manner, and with fairness and consideration for the interests of the other party in the controversy. It is little wonder, with this spirit controlling, as it does, the work of all State association gatherings, that Hardware organizations everywhere are recognized as standing for fair treatment for all and special favors to none.

Organization Growth.

He remarked that since the last National meeting three new States, Mississippi, Alabama and Tennessee, had been organized and were now members of the National Association. Suggestion had also come from the California Association indicating that the matter of joining the national body was under consideration. It was felt, however, by the present officers of the national organization that owing to geographical considerations it might be better if the Pacific and far Western States, four of which are now organized, California, Washington, Oregon, and Idaho, should form a Pacific branch of the national body. Mr. Miles believed that a strong affiliated organization of this sort would be able to handle questions peculiar to that section of the country to better advantage while by co-operating with the national association they could work out problems of national scope and character. He also suggested that the Texas association, a strong and influential body, should be urged to join the national.

Mutual Fire Insurance.

Touching on the subject of mutual insurance, Mr. Miles spoke as follows:

While we are to have a report upon the mutual insurance feature of our association work, I cannot refrain from touching the subject briefly, and to congratulate the Hardware merchants of the country on being able to place so large a percentage of their insurance with the best and safest insurance companies doing business in this country to-day, and at a saving to them in cost of from 25 to 50 per cent. While this insurance feature has outgrown the wildest imaginings of any of its organizers, I feel safe in making the prediction that it is only in its infancy, and that it will eventually be the means of revolutionizing the insurance business of the country. Profiting by the example we have set, other lines will organize to carry their own insurance, until eventually there will be little business left for the stock company doing a general business; each line of trade will be carrying its own risks.

In this work, as well as other features of the association movement, the individual member can render great assistance. He can do this by being fair in his demands on the Hardware mutuals; by not undertaking to take advantage in any way on rates; by doing everything possible to safeguard his own risk, and by placing all of his insurance, as fast as possible, with Hardware mutuals.

Mr. Miles suggested that it was desirable to get in closer touch with organizations in other lines. In the campaign against parcel post it had been urged at Washington that the Hardware people seemed to be the only ones that were making vigorous opposition. In a sense this was a handicap, and if the Hardware organizations could do anything that would in any way secure the co-operation of associations in other lines it would materially promote the general welfare.

Recommended Legislation.

After paying a high tribute to the work of Secretary M. L. Corey, he said that inasmuch as the association has always stood for growth and progress generally, it should now put itself on record in support of the following legislation:

A national pure paint law.
A national pure seed law.
A national good roads law.
A national system of irrigation of arid lands.
A national development of inland waterways.
For the better preservation of our forests.
For a reduction and regulation of express rates.
For honesty in advertising.

And we must continue to stand against any legislation looking to a centralization of business or a curtailment in any way of the growth and development of our smaller cities and towns and our agricultural communities.

He concluded as follows:

The work of this organization has grown beyond that of mere trade discussion. Each year marks a forward step; the entrance into a broader field; the accomplishment of better things; the placing of association effort on a higher plane. While much has been accomplished, much more remains to be done. New fields are awaiting development, and no man must accept an office in this association in the future with the thought there is little left for him to do. Our progress has been slowly but steadily onward and upward. We cannot and will not take a backward step.

MR. COREY'S ANNUAL REPORT.

In his report as secretary, Mr. Corey said that three new States had become affiliated with the National organization since the last meeting, and that very little desirable territory remained unorganized. Efforts should now be exerted in the direction of building up and strengthening associations identified with the National body rather than seeking new fields, although there were a few States to which help should be extended whenever the merchants showed a desire to get together. Mr. Corey said that about 30,000 letters had passed in and out of his office during the nine months that had elapsed since the 1907 convention, which was held in Boston in June. He had personally attended 10 of the State retail conventions, besides participating in meetings of other bodies, including several not directly identified with the Hardware field, and had traveled over 15,000 miles and in or through 25 States. Mr. Corey suggested a rearrangement of State convention dates on a territorial basis, so as to have as few conflicting dates as possible, reference to which is made elsewhere. He also touched on the necessity of introducing some new features in convention work, with a view to sustaining the interest of members and encouraging their attendance. Mr. Corey had the following to say in regard to the matter of terms and policies under which the retailer was expected to distribute goods:

Our reputation as a fair and conservative organization is pretty well established. In the forming and arranging of terms and policies under which the retail trade is expected to distribute goods we ought to have more to say. I am glad to announce there is a growing tendency to consult your representatives in this direction. To be able to do much effective work along this line requires more thorough knowledge of the inside of plans and methods that now prevail. We are gradually growing wise, but not fast enough to exercise our full amount of influence on the changing conditions. There should exist a more perfect understanding between manufacturer, jobber and retailer in dealing with matters in which we are mutually interested. A manufacturer of a well-known specialty, which is sold under a controlled price agreement, recently told me that he was guided in making changes of prices and terms almost entirely by criticisms that came from our conventions. The prosperity of the retail merchant is a matter of deep concern to both manufacturer and jobber. Anything that prevents us from supplying the goods used by the consumer is equally injurious to the maker and wholesaler.

Mr. Corey's report of the finances of the association showed that there was a balance on hand exceeding $8400.

ADDRESS OF FRANK BAACKES, VICE-PRESIDENT AMERICAN STEEL & WIRE COMPANY.

The address of Frank Baackes, vice-president and sales agent of the American Steel & Wire Company, Chicago, was as follows:

It gives me great pleasure to meet so many delegates —such a large, successful, representative body of men; men who handle directly $100,000,000 of our products per annum; and, indirectly, $200,000,000 more; in other words, a total of $300,000,000 of goods you distribute in the course of a year.

Naturally, we are very much interested in you and you in us. Therefore I think it proper that I say something to you to-day on the policy of the United States Steel Corporation.

Cause of the Depression in Business.

Let us look into the matter and see what was the real cause of the present depression. We read a good deal in the newspapers about this man or that man—Mr. Roosevelt or some other prominent men—being responsible for present conditions. In my opinion they have nothing to do with it.

FRANK BAACKES.

What we have gone through was inevitable, and we all knew it—and still we are surprised. We felt it coming for a year; and in the interest of you gentlemen and of the manufacturers of the country, the United States Steel Corporation maintained prices and values. Why? They knew that we had been very prosperous for a year; they knew that the country and the merchants were absolutely loaded up to the roof with material and stocks. Had they followed any other course what would have been the result? The result would have been disaster for every merchant in the United States—the biggest commercial panic of modern times. We prevented it. And, in consequence of that policy we are somewhat misunderstood. I don't think we are misunderstood by the merchants, but by the population at large.

Mutual Interest.

I don't want you to think that because we have taken that position, in order to allow you to liquidate without loss, it was entirely from philanthropic motives; at the same time it was to our own interest. We were as much interested as you were. Had we pursued any other course every man in this room would have had to invoice his stock 25 and 30 per cent. less than he did. And who would have been the gainer?

The Worst Is Over.

These conditions will not be better until we are through liquidating. The worst is over. I have been 29 years in this business, and have always found that good times follow a period of financial depression. Each one of us—the manufacturer, the jobber and the retailer—is carrying his load. There is no shifting of the burden as in previous panics, and, thank the Lord, we are all well off to-day.

Economic Laws Will Govern.

Now, just because the Corporation has taken that stand I don't want you to feel that it means that in future no flexibility of price may be expected. We cannot go contrary to economic laws; we can modify the actions of those laws, and that is what we are trying to do and what we have done successfully up to this time. When the proper time comes—when liquidation has run its course, when the slates are clean—and they must be clean before we can have a new era of prosperity—then, I am satisfied, proper adjustments can be made. But in the meantime you can go on and do business and order goods. Order them as you need them. The wise man always does that. There is nothing in speculation. If every man and every merchant buys just what he needs the fluctuations of prices won't hurt him.

Live and Let Live Its Motto.

I believe the policy of the Steel Corporation, "Live and let live," is generally recognized. Our record for the past eight years speaks for that. You must admit that your interests as distributors for the Steel Corporation's $300,000,000 are in safe hands. We must consult your interests, as well as our own, for they are mutual. We are so big we cannot be anything but honest. We've got to be honest whether we like it or not. That applies to every one of you. The bigger the man the more necessary to follow this policy, and the less dust he can throw in people's eyes. Our policy is absolutely open and above board. The United States Steel Corporation's statements are to-day adopted as models in the leading commercial schools of Europe.

We have nothing to conceal at this time, and shall conceal nothing in the future. We are one of the greatest corporations in the world, and, of course, I am somewhat egotistical on account of my connection therewith.

Credit Was Too Cheap.

Now I am going to offer you a little comfort. That panics will and must come is a foregone conclusion to every thinking man; otherwise the trend of things would have led us into another Mississippi bubble. When this depression is over we will have had time to take counsel with ourselves, to see where we were. Credit is too cheap. This depression was absolutely necessary to afford us an opportunity to realize the situation. We need it once in a while; we must be hit on the head once in a while by something or somebody to bring us to our senses.

Every Man Must Stand His Share.

Now, a word on the labor question. They say that there must be no reduction of wages. I think that's wrong. Labor must also take its share in the present liquidation, because, as we are coming to another period of prosperity, labor will not be satisfied to stand still when the trend is upward. Where will that lead to? There is an Unseen Power that regulates all these things—something that regulates all these affairs, and every man, whether laboring man, or capitalist, must stand his share.

Conservatism the Watchword.

Therefore, this is no time to be pessimistic; but you should be conservative. Conservatism should be your watchword. If you follow that, you will be all right. You are not going to do as much business this year, as last; you will have a chance to make all who owe you pay up—to make all of them pay up. To my mind, the man who can't liquidate to-day, after three years of prosperity, should be "wiped off the board."

Good times will come again; credit is going to be just as cheap as of old. You are going to have the same volume of prosperity that you had before. Only, we must thank the Steel Corporation and other large corporations of the same character for relieving the bad effect of the panic. Prosperity and panics are inseparable.

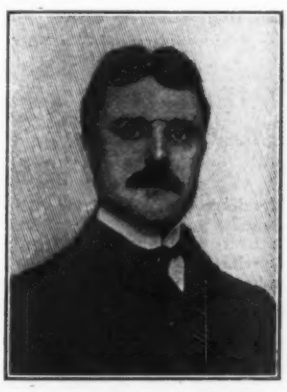
Locating in the Country.

I heartily approve of Mr. Maxwell's ideas suggesting that manufacturers should locate in the country. I don't know whether it was forethought, or because of necessity on the part of the Steel Corporation; but the Steel Corporation is doing just the very thing that Mr. Maxwell spoke of. It is going into the country—I cite the new town of Gary, out of Chicago, as a good example of what Mr. Maxwell thinks should be done.

As I said before, there is absolutely nothing to be pessimistic about. Go home, and attend to your business. Keep your stock up, because you can't do business without stock—and trust to the Lord and the United States Steel Corporation.

ADDRESS OF C. W. ASBURY, PRESIDENT AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION.

Representing the American Hardware Manufacturers' Association, we desire to have you thoroughly realize that we are not unmindful of the great work you are doing. Your organization has proved beyond the possibility of question the advantage of organized effort. Your plan of organization certainly brings to mind careful study and forethought. Through the State associations you are enabled to come into very close touch with your membership and all those who are engaged in the ultimate distribution of Hardware.



CHAS. W. ASBURY.

Value of the National Association.

When you concentrate this effort into a centralized body, as you have done in the National Association, you gather together the very best from each State for the use of the trade as a whole. Furthermore, you are enabled to advise upon business policies which cannot help to be beneficial to the individual members. Those who have come into direct contact with the retail trade are loud in their praise of the result of your efforts. They say that methods in the retail trade are rapidly changing, as a result of your work. Stores are being enlarged, systems are being installed, which means rapid progressiveness. We are not unmindful of the splendid work which has been done by your officers; their aggressiveness tempered with conservatism and wisdom is a subject of

Praise for Officers.

general comment among jobbers and manufacturers. You are all very familiar with the well directed efforts of these officers in opposition to the Parcel Post. You know they have extended beyond your own magnificent organization to organizations in other lines of trade—the result being such a unanimous expression of protest that Congress will naturally hesitate.

Influence in Legislation.

Those who represent the people at Washington always have an ear to the ground, listening for public opinion; and, furthermore, my experience teaches that these public men are only too glad to be informed before taking action. This spirit has been manifested in the hesitancy of Congress in enacting many of the bills which they are urged to enact by labor leaders.

Labor Problems.

The manufacturers, as large employers of labor, are very much interested in the "square deal," as applied to class legislation. You all probably know that the labor leaders are strenuously urging upon Congress the enactment of laws which specially favor them, or relieve them from the penalties of their acts while inflicting the prescribed penalty upon all others. They desire to be free in practicing conspiracy by boycott,

Unreasonable Demands.

while they especially desire to have general conspiracy treated criminally. They desire to restrain the courts in the issuance of injunction in labor disputes. Now, that proposition is really so simple as to need no special description. The very object of an injunction is to restrain temporarily the infliction of injury by one person or persons upon another person or persons until the cause can be heard in an orderly way and judicially determined. There certainly can be nothing wrong with that. Yet there are at the present moment nine separate bills pending in Congress, each attempting to regulate the judiciary in such a way as

Anti-Injunction Laws.

to prevent the issuance of these injunctions and labor disputes, and no attempt whatever is being made that the injunction shall be otherwise restricted in other cases.

There are many bills pending looking toward a compulsory reduction in the hours of labor upon all contract work for the Government. This you can readily see will quickly mean the establishment by law of an 8-hr. work day. If this can be accomplished in an orderly way I know of no objection to it.

Reducing Labor Hours.

But stop and think. One concern has a contract with the Government; at the same time this concern is doing a large amount of work for the public. They would be compelled to operate that portion of their force which is engaged upon Government work 8-hr. only; whereas, the other portion of their force must of necessity work longer. This would bring chaos into any manufacturing establishment. Far better let the hours regulate themselves, and the tendency will be to lessen them as the time goes on. And

Confusion Should Be Avoided.

it will probably be but a comparatively short time when the hours will be voluntarily reduced and the same object accomplished—but without force.

Labor Leaders Do Not Always Represent Unions.

These and many other things are being attempted by the labor leaders. And you will notice that I distinctly specify labor leaders, and not labor unions; the large bulk of the membership of the labor union is composed of members for peace sake only, and not because they are in harmony with the movement. This I have amply demonstrated in my own experience. Last spring we had a very small number of men in one department who went on strike upon the usual foolish proposition. After remaining out about two weeks and finding no evidence of weakening on our part, the labor leaders concluded that the only effective weapon they could use was to call a sympathetic strike in the entire plant. They arranged to have orators from the American Federation of Labor and from the International Association of Machinists address a general meeting called for the purpose of urging a general strike. I concluded that our proper course was to attend the meeting. After the usual speeches—class against class—had been delivered, I concluded that our employees only asked to have the truth presented to them, and if it was so presented we need entertain no fear.

Members for Peace's Sake.

A Sympathetic Strike.

Fair Dealing with Employees.

I stated openly before the meeting that we had no objection to labor unions; that not one man or boy within the hearing of my voice could claim that he had ever been asked the question whether or not he was a member of a labor union; whether he was a Baptist, Presbyterian, Methodist or Catholic—to us it made not the slightest difference. All that we asked of any of them was that they should have proper moral character and that they should work well and be well paid. This is the beginning and end of our contract with them. I said that I would be even more specific in saying that if they could show me a labor union managed for the uplifting of labor I would not only say that we had no objection to it—I would actually subscribe to its treasury. If I were asked to be more specific still I could quote an actual instance which has been called to my attention, the instance being an employer right in the city of Philadelphia employing largely female help. He employs a woman to keep the toilet rooms clean. He contends that this work is done in the interest of his employees and should therefore be paid for by them. He assesses them from 8 to 10 cents per week each, in order to pay the scrubwoman; net result, he collects from $28 to $30 per week and pays her $6. I said, "Go for him and I'll help you." It is unfortunately true that there are some unfair employers, and the field for profitable activity is wide for the labor union. It certainly has a great work to do, and if the work is properly directed it can be well done for the uplifting of labor. But when the labor union attacks a concern like the Enterprise Mfg. Company in such an unfair way, or for such an unfair cause, as the one now existing, we will certainly fight, and we will fight to the bitter end.

The result of this talk to our employees was that not only did they refuse to go out in a sympathetic movement, but those who were complaining actually withdrew their complaint and came back to work. This shows with some definiteness that the great body of the members of labor unions are inclined to be fair, reasonable and conservative.

Fairness to Employer and Employee.

My object in calling attention to this subject is to ask the assistance of your affiliated bodies in securing absolute fairness in legislation—both to the employer and to the employee.

Mutual Fire Insurance.

There is another branch of your activity which has attracted attention: mutual fire insurance of your members. Many of those engaged in industrial pursuits have long maintained mutual insurance, and have found it to be exceedingly profitable to them. To cite our own case: Our plant was insured in the stock companies for some years when, through disagreement with them, we concluded to join the then young mutual companies. The result has been a reduction in our rate from $1.25 to less than 8 cents as an average for the past five years. I predict success in your endeavor in that branch far beyond the expectation of those who are now joining the movement.

Preference for Standard Brands.

I am going to advocate to you one other item which I believe you will find beneficial: If you can induce your members to give preference to standard goods of quality, it will certainly mean the hope of greater permanency and greater profits in your business. If you sell an article, well worth the money, and of good, durable quality, you are making a permanent customer. It is not every dissatisfied customer who files a complaint. Many will harbor their dissatisfaction secretly and turn their business into other channels. There is one thing no merchant, no jobber, no manufacturer can afford: and that is the loss of customers.

Inland Waterways.

My attention was attracted to another item, suggested in Mr. Bogardus' address, yesterday: Waterways for the more efficient transportation of merchandise. We are all familiar, through the utterances of the President, with the great Mississippi Valley project; and, without desiring to detract one iota from the greatness and the large value resulting from this undertaking, I am going to suggest another, which seems to me to have equal possibilities. The Atlantic seaboard is made up of a succession of elongated islands and peninsulas, which give a very excellent opportunity, formed by Nature, for inland waterways. Do you realize that, in acquiring and enlarging three existing canals, and projecting the fourth, the total length of all being but 66 miles, a continuous inland waterway can be formed very nearly 1000 miles in length? A canal is now being constructed through Cape Cod, which will connect Boston with New York. There is an existing canal from New York harbor to the Upper Delaware, which connects New York harbor with Delaware Bay; an existing canal across the short neck of Virginia, connecting Delaware and Chesapeake bays; and the one canal remaining is at Beaufort, S. C., which will complete the chain. If this scheme is carried a little farther by the use of the Erie

Atlantic Seaboard Canals.

Possible Development.

Canal from the Hudson to Lake Erie, then a continuous waterway will be formed from Duluth, in far Minnesota, to Beaufort, S. C.

Again, if a canal should be constructed between Pittsburgh and Lake Erie, the connecting link would be formed between the Mississippi Valley project and the Atlantic Ocean.

Advantages to Commerce and in War.

I need not take your time in describing the advantages of these waterways, not only to commerce, but in the protection of the country itself, in times of war. Consider for a moment the advantage of having such an inland waterway along the Atlantic seaboard for the use of the navy. The vessels could be harbored in any of the existing navy yards inland, and they could be mobilized and emerge at a point unknown to the enemy.

Permit me to again express to you the very high appreciation I have of the courtesy you have extended to me through your officers in permitting this talk. I look forward to the time when very much closer conferences will be the daily rule among manufacturers, jobbers and retailers. I think I can see great benefits to be derived from these conferences, and I can only express the hope that they will be furthered.

R. W. SHAPLEIGH ON "ARE GOODS WELL BOUGHT HALF SOLD?"

The phrase that composes the subject of this paper is one of those compact, crisp, potent sentences commonly called proverbs, maxims, wise sayings, old saws, &c., and I wish, in passing, to pay my respects to the man who gathered the wisest of these proverbs together from the different nations and tongues, and set them systematically and in order before the people.

Maxims That Stick.

Don't you remember the adages contained at the head of each page of your copybook when you were learning to write at school? Alas! now so many years ago for many of us. Can you not see them before you now? I am sure you cannot have forgotten them. Some of them are as follows: "Congenial occupation makes work easy." "Idleness is the first cousin to ignorance." "One example is better than 10 precepts." "It is hard for an empty sack to stand upright." "It 's never too late to mend," as the boy said when he brought his torn trousers to his mother at 12 o'clock at night. The great seal of the State of Missouri contains one, peculiarly applicable to the National Retail Hardware Association in convention assembled to-day: "United we stand, divided we fall."

R. W. SHAPLEIGH.

There are hundreds of these trite sayings, each with a deep and sober meaning contained in very few words. In fact, these old proverbs contain practically all of the philosophy and wisdom of the ages boiled down. For over 150 years they have been in daily and hourly use, and scarcely a situation can arise to which one or more of them is not applicable in a practical way. If we read, mark and inwardly digest them, we find that they are not simple, but that their true meaning reaches down to the innermost fibers of the subject they relate to.

Wisdom Boiled Down.

Thus it is with our present text, "Are goods well bought, half sold?" At first appearance this saying appears to be perfectly simple, and self evident, but let us analyze it. Let us divide it into two parts, because in modern business affairs, while the buying and selling of goods should be and are, intimately interwoven, the characteristics of the two parts are entirely different. In taking up the first part, "goods well bought," it seems that the essence of this phrase lies in the definition of the words "well bought." In other words,

When Are Goods "Well Bought"?

On this point there may be many differing opinions, but if we can establish good, practical methods of buying goods *well*, we have solved the first portion of the subject. Let us, therefore, attempt to establish a few rules, the observation of which will insure us of goods being well bought. The two most important principles in buying goods are entirely self-evident. They are as follows:

1. To have the goods you need when you need them.
2. Not at any time to have goods that you do not need.

This is a beautiful theory, but poor human nature cannot, in practice, absolutely meet these requirements. The buyer who keeps these maxims constantly in mind, and is not diverted by the bait of attractive prices, is the one who comes nearest to perfection in this matter. We superior men often laugh at the eagerness of the bargain hunter, who rushes down town to purchase something that she has seen advertised at a low price in the paper, when she doesn't need the article at all. She rushes to get it simply because it is cheap. But do we, in our business, adopt firmly the first principle above mentioned? After these comes, less in importance, really, the question of *price*. Ah, price! How often does this little word obscure the buyer's vision to the exclusion of all other considerations? How often does he think that the mere figures given him represent the price?

Weakness of Bargain Hunting.

Temptations of Price.

Price a Complex Matter.

What is the price? What goes to make up this item that seems to stand foremost in the mind of almost every buyer? If some one were to offer you an article at a price 5 per cent. less than some one else, has he offered you a better price, and should you, in justice to yourself, give him the order? Not necessarily so by any means. This matter of price is a complex affair and mere figures do not by any means constitute it all. There are many other things to be taken into consideration before we can arrive at the real price. The quality of the goods to be received must be looked into very carefully. Have you not often bought goods because the figure on them was very cheap, only to find that they are poor in quality, badly packed, slovenly in appearance, and really dear at any price? The promptness with which the shipments are made is, in this age of quick service and frequent orders, a thing greatly to be desired. The completeness with which the order will be filled is also a vital question. Many times, in the experience of every one here, I am sure, have you paid a little higher figure in order to get all the goods you ordered. The character of the packages and the attractiveness of the labels on these packages is a point often not thought of, but of much importance, in order that the goods may present a pleasant appearance on the shelves. Also the manner in which the goods are packed in cases and the condition in which they will reach you should not be overlooked. Again must be taken into consideration the reputation of the house for shipping honest, full weight, full size, and clean, fresh, up to date merchandise, and the reputation of the house for prompt and fair adjustment of any claims.

Figures Not Everything.

Quality.

Shipments.

Packing.

Reputation of Seller.

Good Service.

All these items constitute service. Consider the reputation of the house for good service and honest dealing generally. All of the above are as much a part of the complete price as are the figures, and a careful consideration of them all is necessary in order to buy goods well. Is it not within the experience of each of you that you would prefer to pay a little higher figure when you know that you will get good service, good goods and good treatment in every particular?

Willingly Paid For.

It is a well established principle in business that good service is part of the price and should be paid for even to-day under the closest supervision by law. Some railroads are allowed to charge a higher price for the same haul on account of their giving better service.

A Part of Price.

In this age of close competition and close scrutiny the jobbing Hardware house must be right in price to be successful. Indeed, there is no margin in this business for a serious difference in mere figures between reputable concerns, although there may be a vast difference in the other items mentioned as comprising the complete price. The margin of profit made by jobbing houses to-day is extremely small, and the dealer who says he can buy at 10 per cent. or even 5 per cent. cheaper from one reputable concern than from another reputable concern on an assorted purchase is indulging in a large consignment of "hot air," or else is very ignorant.

Jobbers' Prices Show Little Difference.

Ordering Seasonable Goods in Advance.

Referring to the first principle to adopt that goods may be well bought, viz.: to have the goods you want when you want them, it is very necessary to look ahead

and to place orders for seasonable goods in advance, so that they may be in stock when you need them. Manifestly, if all waited for the opening of the season and all ordered this seasonable item at practically the same time, the stocks of the jobbers would quickly be broken and many dealers would be disappointed. The burden of this is borne by the jobbers, as they give a future dating on such orders. There has been some argument against the policy of placing "future" orders, but it is all false. Future orders are necessary, since it is physically impossible for the factories to supply the demands of the trade for seasonable goods unless they receive their specifications long in advance of the season and have an opportunity to make up and assemble the goods. It is quite evident that a careful observation of all the above mentioned rules will surely result in goods being *well bought.*

Jobbers Bear Burden.

Future Orders Necessary.

Relation Between Buying and Selling.

Now, let us now turn to the second portion of our text, and see if this careful buying will result in their being half sold. I am not at all prepared to say that this is true, for no matter how well goods may be bought, they will not sell themselves, and while good buying certainly does help to sell, it seems foolish to think that it helps out to the extent indicated in the text. In my judgment, the selling of goods in the proper way, is a more important and difficult operation than the buying. The buying is done, usually from houses of such a character that they will take the proper care of the orders of their customers voluntarily, but when it comes to a matter of selling, the whole burden lies on the merchant himself. Therefore, it is the most important feature of the business, and the disposing of his stock at a proper profit the most important and difficult part of the proprietor's duties. Even if it were true that goods well bought were half sold, no live merchant would be content with that. He would want the remaining half well sold, and the last half is much harder than the first half. It is with considerable regret that I cannot adopt the whole proverb as being absolutely true, but I know how difficult it is oftentimes to properly dispose of goods, be they never so well bought. Let us, therefore, attack the selling problem with more vigor and intelligence than heretofore. Let us give more thought to this feature of the business than we have done in the past.

Goods Won't Sell Themselves.

Two Halves to Be Sold.

Easier to Buy Than Sell.

Is it not true that it is much easier to buy than it is to sell? If it becomes known that any person desires to buy an article—a horse, a house and lot, or even any small item—he is immediately besieged by sellers of all descriptions, and often he is puzzled to know from whom to buy. How different it is when one has a horse, or a house and lot to sell. He often finds it takes a very long time to find a buyer, and then they want to get it for less than it is worth. To illustrate: I was besieged last week by the representative of two factories desiring to sell me an Automobile. I didn't want to buy one, hadn't said so, or even thought of it; for this is no time to buy Automobiles, and yet these men were diligently seeking for buyers, and spending much time and effort on very long chances.

Some Principles of Selling.

It is not in my province to attempt to give you experienced merchants any advice as to how to sell your goods. You know how, much better than I, but from general observation it has become impressed upon me that the most successful retail merchants are those whose stores, in the first place, are most attractive; stores in which the atmosphere, as well as the floors and shelving, is clean and sweet; where the ladies are welcome, and where the surroundings are such that they are glad to enter; stores where the clerks are neat and clean in their appearance; polite and attentive in their manners; where they are not smoking or chewing tobacco, or talking politics; stores where the shelves are filled with neat, clean, attractive packages, and where the proprietor is visible in the front part of the store, looking after the interests of his customers, and by his presence indicating to them that they are his first consideration. This in contradistinction to the proprietor who is rarely visible in the front part of his store, but spends his time in his office figuring over invoices and bills in an endeavor to buy goods cheaper, rather than interesting himself in adopting new and taking methods of selling goods, and being willing to spend a little money in that direction, if necessary.

Attractive Stores.

Presence of Proprietor.

I have noticed also that the most successful stores are those in which the clerks are well posted on the talking points of the different articles, and where they know the practical and everyday use to which these articles are put. People like to deal with those who can talk intelligently about the merits of an article, and who seem, at least, to know more about it than they themselves do. Many times a person will go into a store in search of information as to what he needs in order to do a certain thing. If he receives intelligent, practical advice, he will buy, and come back again. If not, he will not buy, and probably never come back.

Well Posted Clerks.

Pictures are very well in their way, and interesting, but the goods themselves, particularly in the Hardware and kindred lines, seem to have a fascination for the average person that is hard to overcome, and the proper displaying of one article is better than 10 pictures.

Goods Must Be Shown.

The first impression that one receives is sometimes very strong, and the impression made on a passer-by by a beautiful, harmonious show window—a window in which everything is neat and clean and good, or where some striking novelty is shown, an index of the character of the entire establishment, is too valuable an asset to be overlooked.

Attractive Windows.

Both Departments Important.

In conclusion, I will say that while my argument is not proven that "Goods well bought are half sold," let us not forget at all the real importance of buying them well. It is your duty to yourself to purchase your goods at the lowest price, and it is a part of the business that cannot be slighted in the least degree. But in considering as to what is the lowest price, let me urge you to take into your reckoning all the points above mentioned. Then after having done your duty with respect to the *buying*, use your best intelligence and energy in *selling*. Then will your goods not only be well bought, but well and completely sold.

E. C. SIMMONS ON SALESMANSHIP.

It seems peculiarly fitting that this convention should be held in St. Louis, because it is—as Mr. Norvell has recently said—the largest and best Hardware market, not only in this country but in the world, and it has been made so chiefly by reason of good salesmanship. In view of that statement, can you question the great importance of the science of salesmanship in the conduct of your business? Do you know that the sales of the Hardware jobbers of St. Louis are more than the combined sales of all of the Hardware jobbers of New York, Boston, Philadelphia and Baltimore? For that reason, the selection of this city as your place of meeting seems eminently correct. If there is any word that I can say, any experience that I can relate, or any suggestion I can make that will be of substantial benefit to even one man in this audience, I shall be glad to have been permitted to speak.

E. C. SIMMONS.

Present Study of Salesmanship.

This subject has been so talked about and written about in the last five years, and so frequently the subject of papers or addresses, that I feel it has been thrashed over and thrashed out until there is but little if anything now to be said about it. I am rather fearful I may weary you in saying over again, in perhaps different form, what you have so often heard and read about before. You want a recital of facts, not theories, a relation of things accomplished and how they were done, rather than some one's imagination as to how it should be done. There are schools for salesmanship, and while I am not well posted as to their work, it is difficult for me to understand how salesmanship can be successfully taught in schools. It reminds me of an article by an old maid on "How to Raise Children," or the old story Mrs. Partington, who heard and old maid say "I can't bear children," and she replied, "Perhaps if you could you would like them better." If in the course of my remarks the personal note should appear, I beg you to excuse it. I shall try to avoid it; but I have been in the Hardware business so long and been so active in it that I feel myself to be part and parcel of it.

Salesmanship in Schools.

Relative Importance of Buying and Selling.

I regard good salesmanship as of the first importance in the conduct of the retail Hardware business. Here let me say that I will treat on salesmanship both of wholesale and retail houses, and I may mix them up a bit. If I do, kindly pardon it, as I have had experience in both, and they are so interlinked in the same qualities that one can hardly speak of one without reference to the other. I say, therefore, that salesmanship is the most important factor in the successful conduct of the Hardware business. The best evidence I can give of the sincerity of this statement is the fact that during all of the time that I actively managed our business I gave most all of my time to the selling of goods. When it came to the buying, I would do that largely on honor of the man I was trading with, and make short work of it, I assure you, so that I could get back to the selling end of the business as quickly as possible. I remember once buying a bill of Pocket Knives of Mr. Graef, who afterwards said that I bought over 4000 dozen assorted Pocket Knives in less than 30 min. Let me say in passing that my experience in trading "on honor" with manufacturers and their salesmen was always satisfactory, for never did one of them betray the trust I put in him. Don't draw the conclusion from what I have just said that I do not regard the buying end as important, for I do. The stock of goods you have to sell is the foundation stone of your business house, and we all know that unless our house has a good solid foundation the floods and winds will soon destroy it; but I mean that the buying is, so far as price is concerned, far less important than the selling, for I take it that the difference in price on articles of equal, or nearly equal, value is not 5 per cent, and therefore of far less importance than the selling end. The old adage that "goods well bought are half sold" is obsolete, and is to-day misleading; goods should be well bought, but, if so, it does not necessarily follow that they are half sold. It requires brains, tact, good nature and diplomacy to sell them.

Buying on Honor.

Old Adage Obsolete.

In an address that Mr. Norvell made last month in this city, before the Retail Hardware State Association of Missouri, he referred to a number of men who had prospered and become pronounced successes in the commercial world, who had been connected with our house, and he named R. H. Stockton, J. E. Pilcher, C. D. Smiley, J. K. Smith, H. M. Meier and C. H. Markle, and to this list I would add, as a noteworthy example, the name of Saunders Norvell. All of these men prospered, and have taken a front rank among commercial men. To these names should also be added that of my late and always deeply lamented partner, Isaac W. Morton, who was a bookkeeper and then a salesman for us before he became a partner of the firm and afterwards an officer of the corporation. I have named those gentlemen for two reasons: First, because it makes me happy to have it said that so many men profited and succeeded in such large measure by association with our house, and, second, because I want to impress it on your minds that those men were all salesmen, and that their success in life is due to the fact that they were good salesmen. Speaking of the wholesale business, a good road salesman is the most independent man engaged in the business. His wares (and by that I mean his salesmanship) are always in demand, for during all the time of my active direction of the business I never had a man who applied to me, and who impressed me as a "cracker-jack" salesman, get away. No matter how full we were, or how dull business was, I always engaged him, and never failed to do so in one single instance.

Successful Salesmen.

Demand for Salesmen.

The Qualities of a Salesman

have been so often written up that it seems superfluous to recite them, but in simple language I would say he must be "As wise as a serpent and as harmless as a dove." He must have capacity, health, industry, integrity, and be an early riser. Just why he must be an early riser I can hardly explain, except that the head is clearer and one is able to plan better by early rising than otherwise; but this I do know—that all of those men whose names I have mentioned as being very successful salesmen have been early risers. Industry is essential, because no man can possibly succeed in large measure in the Hardware business—wholesale or retail—unless he is a worker. It is a business of such great detail that he must work hard, real hard, or go to the "financial graveyard." Health is necessary to enable him to do the work required, and integrity must possess him, because if he is untruthful he cannot command the respect and confidence of customers, and without that his success will be small. To these qualities must be added tact or diplomacy. He should never contradict a customer—it never pays—one may differ pleasantly without contradicting. He should be a good mixer, and cultivate such habits of thought and conversation as will make him a welcome guest wherever he goes, and the better posted he is on general topics outside of his business the more welcome and the more successful will he be. I would impress upon your minds the great value of good "small talk" properly applied as a most important help to any salesman. I mean this to apply to the retail salesman, as well as the road man representing the jobber.

Industry Essential.

Value of Small Talk.

Good Retail Salesmen Not Always Successful Travelers.

I am often asked if a good retail salesman will necessarily be successful as a wholesale salesman. I say most emphatically No—not necessarily. The fact that he has been a good retail salesman is greatly in his favor, but I have known many good retail salesmen to make absolute failures as road men. The qualities required are different. The customer who comes to the retail store has a distinct want—he asks for some given article that he needs, and it is then up to the salesman to sell it to him, and to sell something else if possible before the customer departs. But with the traveling man it is quite the opposite. He enters a man's store, and is told at once, "There's nothing doing," "Don't want a thing this time," &c. Then is when the master mechanic salesman gets in his work, and convinces the merchant he does want something, and before he leaves he has booked a handsome order from the man who didn't want a thing. It's a contest of intellect; a triumph of mind over mind, which requires brains of an experienced and high order—it's no boy's work I assure you.

Contrasting Requirements.

A Contest of Intellect.

A Good Traveling Salesman Defined.

My favorite definition of a good traveling salesman is "one who helps his customers to prosper," for if the retail merchant does not prosper, how impossible it is for the jobber and his salesmen to prosper. The interests are so interlinked that they are identical. Hence, I say that a salesman who is not truthful, or who does not try to do his level best for his customer at all times and under all circumstances, or who is tricky or guilty of sharp practices, is a fool. A salesman must be a man of good habits to succeed. The day has gone by, thank God, when treating or taking a man out to get a drink, was in vogue with desirable merchants; but just why a retail merchant will continue to give orders to men who get drunk and have other bad habits I cannot understand. A few years ago I was talking with a merchant who divided his trade—giving one-half to our man, and the other to an Eastern man—who was notorious for being under the influence of liquor. I said to him, "Don't you get as good service, as low prices, and as good goods from us as you do from the other party?" He said, "Yes, and I get quicker and more complete shipments." I then said, "Why do you put these two men on an even basis? This man has been for years coming to you under the influence of liquor; my man never has, because he does not drink, and besides he is a perfect gentleman from his toes to his head." "Well, the other party is a good fellow." "Yes," I replied, "but my man has always been upright, sober, truthful and painstaking to please you. Are you rewarding him for his good qualities? I think not." He replied, "Well, I never thought of it that way, but I believe you're right, and if that other man doesn't stop drinking I will quit him and give your man all my business." Now, I think there is too much of this "good fellow" sort of business, and that you ought not to give your orders to men whose habits and character do not command your respect. If a man is not worthy, turn him down, and patronize the worthy salesman, and in that way compel the house to send out good men and men of high character.

Good Habits.

Character Should Be Recognized.

Salesman Must Know Goods.

In the Book of Proverbs, Solomon says: "The principal thing is knowledge; therefore, get wisdom." There is no line of business in which this is more important than in Hardware, and I would impress it, with all the emphasis I possess, upon every man within the sound of my voice to-day, and if haply these remarks should be published in any trade journal, upon all Hardware merchants and their clerks who may read them—to know your goods—to learn if they are good, why they are so, and how one article is better than another, that you may with a clear conscience recommend and guarantee them and sleep sweetly afterward. Are you willing to pay the price of success? That price is study and labor—work—plenty of hard work. You all like to buy of the salesman who knows his goods, who is posted both as to prices and quality, who can quote you the principal items offhand without thumbing his catalogue and

Study the Price of Success.

keeping you waiting. If this be true, as I am sure it is, are not your customers like-minded? Do they not want to be waited upon by people who know what they have and the merits of same, as well as the price. When I sold goods the greatest want of all in retail Hardware stores was salesmanship. A good salesman (whether proprietor or clerk) was a great rarity. Since then this is greatly changed; most all successful retail stores have very good salesmen, and many proprietors take great pains to teach their clerks the general principles of salesmanship. One of the best salesmen I ever knew gave me this reply to my question as to what he considered of first importance in selling goods,

"*Know 'em and Show 'em.*"

There's a whole sermon in these five words. Know your goods and show them intelligently. I recall an incident of only a few years ago when I went into the store of one of our customers and found him on a ladder counting or taking stock of his Tinware. He greeted me with "Good morning," and kept on with his work. That was all right, but a few minutes later two ladies entered and he called down to them from his ladder, "Well, what is it this morning?" One of the ladies said, "I want a six quart Granite Milk Pan." He replied, "We haven't any," and kept on counting his Tinware and the ladies went out. Such a merchant can never succeed; this man failed within two years. Perhaps you will say I am taking an extreme case and no such things exist at present. Perhaps not. This was 10 years ago, and merchants are better educated—more polite, tactful and resourceful now than then. I believe this is true, and largely due to the benefits from membership in your State and national associations. Long may they live and prosper! I have always been in favor of them and consider them a great benefit to each and every member, because you come together in the most friendly spirit and learn from each other how to improve your business and to conduct it more profitably and successfully.

A Whole Sermon.

Benefits of Associations.

Good Men and Good Goods.

I believe that our house was the "pioneer" in establishing the principle of paying salesmen all they are worth, demonstrated by results, which has been copied (substantially) by every other jobbing Hardware house in this country. I don't believe in cheap men for salesmen. If you get a good man, or the "makings" of a good man, develop him; encourage him; pay him all he is worth. Don't wait for him to ask for it—volunteer it, but do it on the basis of payment after the service has been rendered. Encourage the sale of good goods rather than cheap goods. They are the cheapest in the end and will give greater satisfaction and also pay you better profits. A good Hand Saw is cheaper at $2 than a poor one at 50 cents. If a party buys of you something "cheap" that proves unsatisfactory he will always remember you or your store unpleasantly, and never think of the price or how cheap it was; whereas, if he buys a good article that is absolutely satisfactory he will not only remember you pleasantly, but will speak a good word for your store and recommend his friends to you "because you keep good goods."

Good Goods Cheapest.

When I say "try to sell good goods," I don't mean that I would not keep any cheap or low priced goods, for I would, just to show I had 'em, but, mark you, I would keep them, not sell them, so far as was possible. I would show the cheap goods first, where it seemed policy to do so, but would say, "Now, these are cheap goods and I cannot recommend them, but I have something here—producing the better goods—that I can swear by and guarantee in the strongest terms possible."

Keeping Cheap Goods.

Good Salesmanship Exemplified.

Here let me give you an incident that occurred in Florida about a year ago. I was in the store of one of our best and most intelligent customers, when two men came in (evidently carpenters) and asked for a Hand Saw. The clerk took out two standard brand Saws and laid them before these two men, but said nothing. One asked the price, and the clerk said, "$1.50 each," then silence ensued again. "Have you any others?" said the carpenter, and I motioned to the clerk to show another kind he had on the shelf, which he did. I then stepped up and said, "My friend, I know that to be one of the best Hand Saws in the world." I took it and "snapped" the blade; then I rung it with my finger tips, and said, "If you buy this you will never regret it." "What's the price?" said he. I answered, "$2." "Whew! I couldn't give $2 for any Hand Saw on earth." I said, "All right; I took you to be a good carpenter who wanted the best tools." He responded, "I am. I'll give you $1.50 for it." I said, "No; $2 is the lowest price." He said, "Well, I'll compromise it, and give you $1.75 for it." I said, "Not on your life; nothing less than $2 will buy it." He then said he wouldn't buy a Saw, and started for the door, so I called to him, saying, "If you buy that Saw you will like it so well you will take it to bed with you every night; and more than that, you will kiss it before you put it in bed. Don't forget it is sold on the basis of 'money back if you don't like it.' You run no risk." He said, "Well, I'll take it; wrap it up." When they had gone I called the clerks together and explained how this man had made a profit of $1 for the house, instead of about 35 cents, as he started out to do, and the way for them to earn good wages was to sell good goods at good prices. Three days later this carpenter came in and bought another Saw of the same kind, paying $2 for it, to take to a friend, who was working some 60 miles up in the country, and stated that the other was the best Saw he had ever owned or used in his life. I firmly believe that I transmitted to him, by good salesmanship, the confidence I had in the tool. This winter, when I visited them again, the proprietor referred to the incident, and said it had been of great benefit to his clerks, and they often talked about it.

Infectious Confidence.

Speaking of good goods, have you noticed how many failures there have been lately of the 5 and 10 cent stores and Racket stores? Lots of failures since January 1. That class of trade cannot stand the pressure of hard times and empty dinner pails.

Personal Attention to Customers.

There are so many kinds of salesmanship I cannot attempt reference to any considerable number of them, but I earnestly recommend to you to meet and welcome—by personal contact—all of your customers when they enter your store. A cordial grasp of the hand and welcome: "How are you, John; how's the wife and babies; is the gray mare over her lameness yet, and how's the farm work getting on?" &c., &c.—is worth more than all the low prices you or your competitor have to offer.

A friend of mine started in business in Minnesota, and was not successful. He came to me and asked if I could tell him what was the matter. I replied, "I can't tell, but I will come up and look you over—maybe I can tell then." I did so, and found he was spending most of his time in his back office, figuring on how to buy something 2½ to 5 per cent. cheaper, and working on his books. I said: "Get out of this—get you a small flat desk—put it near the front door—greet all your customers—tell them you are glad to see them—ask what they want, and then call a clerk to wait on them. What you lack is personal contact with your customers. You are trying to make 2½ to 5 per cent. in your buying, while you are losing 33 1-3 to 50 per cent. in the selling end." He followed my advice, and is to-day a rich man, and often says he never got a start until he put his desk by the front door.

Expert Opinion.

I strongly advise you to do the same—there's nothing like personal contact. People want it—they expect it—appreciate it, and will have it. Don't, I beg of you, spend your time in your back office—keep out in front—mix with the people—welcome them—treat every person who enters your store as an honored guest, if you would succeed. That is good salesmanship of the highest order.

When I Was a Boy,

working in stock in the house of Child, Pratt & Fox (I think it was in 1857) it was my special duty to get out the orders sold by Mr. Fox. I was known as "Fox's boy," and he was "Foxy" not only by name, but by nature. On one occasion, a man whose name was Jake Smith, from Topeka, Kan., came to buy a new stock, and Mr. Fox waited on him. When the order came to me to get out, I saw that a lot of the goods were sold at higher prices than those marked on the samples in the sample room, so I took the book to Mr. Fox, and called his attention to it. He said, "You mind your own business, and get out that order—I know what I am doing." Well, the matter weighed on my mind, for I was most conscientiously brought up by my dear mother, and I could not sleep that night for the wrongdoing I felt I was a party to. So next day I went to Mr. Fox and said, "I'm afraid you did not understand me. This is wrong. Don't you see you are doing a wrong—charging a man more for the goods than the marked prices." He said to me, "My boy, let me teach you a lesson. This man lives in Topeka—66 miles west of Kansas City—beyond the rain belt. The goods go by boat to Kansas City, and then have to be hauled by ox team to Topeka. We will never see this man again, and therefore we must make all we can out of him now, as we will never get another chance; so run along, my boy, and finish up the order." But, I was not satisfied, and said: "But *it's wrong—it's wrong,*" until he threatened me with discharge. Well, next spring, after the ice had passed

out of the river so the boats could run (there were no railroads in those days), Jake Smith came down and called upon Mr. Fox, and I was present at the interview.

Foxy Mr. Fox.

He upbraided Mr. Fox for taking advantage of his ignorance of prices—overcharging him, &c., &c., and called him a lot of vile names; but Mr. Fox took it all calmly, and let Mr. Smith exhaust himself. Then he said: "Jake, you're all wrong; I am the best friend you ever had, and I'll prove it to you before we get through." "Well, do it," said Smith. "Well," said Mr. Fox, "you were going up into a new country, weren't you?" "Yes." "Into a new market where no prices had been established?" "Yes." "You knew nothing about prices, did you?" "No." "Naturally you would base your selling prices on your cost, and mark your goods accordingly, wouldn't you?" "Yes." "Then, I said to myself, I must help this friend to establish good, high market prices. If I sell him cheap, he will establish low selling prices. No, I won't do him that injury—I will charge good, stiff prices, and he will go to Topeka, and, based upon the high prices *I* have charged him, he will establish high selling prices in Topeka, and when he has the market so established, he will come back here again, and I will then sell him a bill of goods so cheap that it will make his eyes water, and he can take them to Topeka, and sell them at the high prices I have been the means of helping him to establish. Now I am prepared to sell you a bill of goods so cheap as to make the two average up to your entire satisfaction." Jake Smith grasped Mr. Fox's hand, and thanked him, and bought another bill of him all right—just as Mr. Fox said he would, and then Mr. Fox privately gave me a lesson on shrewd salesmanship, which I thought so crooked that I left his employ, and went to another firm, who did business on the square. Let me add that Mr. Fox failed shortly afterwards—those kind of people usually do. No salesman can afford to be tricky, sharp or untruthful. He must be squarely honest and truthful, to be in a large way successful. I have recited this merely as a sample of the kind of salesmanship that is never a success.

Recently when visiting Florida, I noticed in a new addition to one of the Flagler hotels some solid mahogany furniture, and I said to the manager, "Why did you think it wise to buy that very heavy furniture?" He replied, "Because I was a fool and didn't know what I was doing. I was looking at some other mahogany furniture that was veneered when some very smart salesman came along and offered me solid mahogany at the same price, and he dwelt so emphatically on solid that I thought it must be better and bought it; but I found out afterward that the veneered was lighter and better and cost more to make; that it won't crack, while the solid will. I was convinced simply because the man was a better salesman than the one who had the better and cheaper goods."

Applied to Furniture.

Brains in Salesmanship.

Take the case of one of the gentlemen whose name I have mentioned as having prospered by reason of being connected with our house—R. N. Stockton. He was a natural born salesman of the first class; he sold a world of Cutlery, chiefly Pocket Knives and Razors, to druggists, and I never found out how he did it until after he had left us, as he never gave away his plans or methods to anybody. It was this: He learned all about tooth brushes, how they were made, what bones for the handles, where the bristles came from, how bleached, how glued in, &c.; in fact, all there was to know about tooth brushes. Then he would go into a drug store, leaving his Cutlery samples by the door, ask for the proprietor and if in he would say, "I want to buy a tooth brush." Then he would talk tooth brushes so intelligently that he would get the merchant interested by telling him a lot of things he didn't know before; then he would buy a tooth brush, thus putting himself in the attitude of a customer. Then his real work would begin, for he would draw from his pocket a sample of Razor or Pocket Knife and say, "I've got something here I want to show you; you haven't anything like it and it's a great seller." And from this he would get a start and then bring up his samples and end up with a fine Cutlery order. That is what I call brains in salesmanship.

From Tooth Brushes to Pocket Knives.

When in Minneapolis last September a customer of Hurty-Simmons Hardware Company told me this story: A farmer near him, who was exceedingly close but scrupulously honest, and who had the catalogue house habit, came to him to buy a Draw Knife, and on asking the price of the best Knife the merchant had, was told 90 cents. He threw up his hands and said he would never pay that for he could send to the catalogue house in Chicago and buy one for 25 cents. The merchant argued with him about quality, but to no avail, and he did send to the catalogue house and get one. When it came the merchant was posted, as he devised means to keep himself apprised of the arrival of the Draw Knife. A week or two later he drove out to this farmer's house, took him the daily paper, had a little pleasant visit and then asked to see the Draw Knife. After looking at it and finding it wretchedly bad, he said: "Mr. ———, will you do me a favor? Let me loan you what I call a real good Draw Knife for a week or two. I don't think you know how they have improved those goods lately." The farmer said, "Yes, I will; some day when I am in town I will get one from you." The merchant said, "I have one in my buggy, let me leave it," and he did so. The result was that in a short time he came in and asked the merchant to trade Draw Knives and let him pay the difference, which was done. The merchant says the farmer is, to a large extent, cured of the catalogue house habit. That merchant was a salesman sure.

Drawing Knives.

Salesmanship May Be Cultivated.

Some people say that salesmen are born, not made. I don't believe it. Almost any intelligent man can succeed as a salesman if he is possessed of good health and habits, is honest and truthful, and is willing to pay the price, which is work, work, and real hard work. Pardon the repetition in reference to work and my dwelling upon it, because it is my confident belief that unless a man is a "worker," he had better never enter the Hardware trade. It is all well enough to have ambition, but to gratify that you must pay the price.

Following Up Collections.

Before closing I want to take advantage of this opportunity of speaking to you on one of the most important parts of your business, and a feature that I believe is sadly neglected by many retail Hardware merchants, and that is to collect promptly. Under the date of December 31, 1907, I received the following letter from one of our very good customers, in which he said:

> On January 13, 1902, you wrote us, in response to our letter asking you to give us some advice and tell us how to conduct our business (which we were then just starting) successfully, and you replied, "Be good collectors." This may seem like a small matter, but these three words have done more to give us courage than all the other advice we ever had.
>
> We reasoned it out in this way: If you thought that a wise policy and had been successful with it, it must be a good thing for us, so we put it into practice. The result is, we have taken advantage of every cash discount since our store was opened, and are worth twice as much as we were six years ago. We thank you over and over again.

I cannot speak too strongly on this subject. It is of vital importance. Never have I known any merchant to achieve any material success who was not a good collector.

Don't Be Afraid to Ask for Your Money

when it is due, because it is due. More failures have occurred in the last half century because merchants did not collect promptly than from all other causes combined. Do you think it well to put your judgment against such a record as that? I hardly think so. When I sold goods, the weakest spots in the conduct of the retail Hardware business were lack of salesmanship and not being good collectors. Perhaps it is so yet. Why not follow

The Example of the Farmer,

who sells his products for cash only? Why is his property or his farm product any nearer a cash article than your merchandise? I can't see why it should be, and yet it is. Did you ever hear of a farmer offering to sell his hogs, his calves, his grain or his chickens on six months' time? I think not, for certainly I never did, and yet if you will permit it, he willingly asks you to sell him your merchandise, which represents cash in labor and raw material just as truly as his farm products. If this meeting resulted in nothing else than the positive determination of each and every one of you retail dealers to become better collectors—in fact, good collectors hereafter—I should say the meeting would be a great success in the best sense.

I thank you for the patience shown in listening to me and for your undivided attention; it seemed to me you wanted a simple statement, giving my ideas and experiences rather than a scholarly essay or an attempt at oratory. My purpose in addressing you was in the hope that some one at least might find suggestion, inspiration and instruction from my remarks—something he could take home, apply and receive benefit from. I love the Hardware business. My work in it has never been a drudgery, but always a pleasure. I plead for higher ideals in our business; better methods; a closer regard to living by the strictest conception of the meaning of the words integrity, truth and fairness. I wish that each and every one of us may so live as to uplift and ennoble the business, so that when we shall have crossed the Great Divide it may be truly said of us that the business in which we were engaged, and the world at large, is better for our having been in it.

Federal Pure Paint Law.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., March 31, 1908.

THERE have been important developments during the past week in the campaign for the enactment of a Federal pure Paint law, and the outlook for the passage of a well considered statute during the present Congress is now regarded as very encouraging by the advocates of this legislation. The House Committee on Interstate and Foreign Commerce has decided to give a hearing on April 7 at 10.30 a. m. upon the bill heretofore introduced by Representative Marshall of North Dakota, a full outline of which has already appeared in *The Iron Age*. In addition to the Marshall bill, Representative Dalzell, of Pennsylvania, on March 27 introduced a second measure, which is understood to have been prepared by the representatives of a number of firms engaged in the manufacture of mixed paints and of the National Association of Master House Painters and Decorators. The hearings on the Marshall bill will probably continue several days and will be followed by hearings on the Dalzell bill.

Readers of *The Iron Age* will be interested in a brief summary of the points of difference between the Marshall and Dalzell bills, as the latter measure will be regarded by the House Committee as a series of amendments offered to the former measure. The Mixed Paint manufacturers have adopted the general framework and the greater part of the text of the Marshall bill, but the changes made are of considerable importance and will be the basis of spirited discussion at the coming hearings.

Marshall and Dalzell Bills Compared.

The Marshall bill makes it unlawful for any person to manufacture, sell, or expose for sale within any Territory or the District of Columbia any Paint, Turpentine or Linseed Oil which is "adulterated or unlabeled," within the meaning of the act. In the Dalzell bill the prohibition is against "improperly labeling or misbranding" goods, and the penalty of one year's imprisonment provided by the Marshall bill is reduced to three months.

Section 2 of the Marshall bill prohibits the interstate shipment of adulterated or unlabeled Paint, Turpentine and Linseed Oil, while the Dalzell bill applies the same prohibition to "improperly labeled or misbranded" goods. The proviso to this section of the Marshall bill exempting goods intended for export and goods sold under a written contract direct to consumer has been rewritten in the Dalzell bill and reads as follows:

> Provided, that no article shall be deemed improperly labeled or misbranded within the meaning of this act when intended for export to any foreign country, the laws of which do not require such article to be so labeled; and provided further, that no article shall be deemed improperly labeled or misbranded within the meaning of this act when sold upon a written contract to a consumer for use in his own business and the label upon which article shall bear conspicuously the printed statement that it is made in accordance with a private formula; but if such article so sold to a consumer under a written contract upon a private formula be in fact resold by such consumer, then this proviso shall not exempt said article from the operation of any of the other provisions of this act; and a contracting painter applying said article on the property of others shall be deemed to resell the same within the meaning of this act.

The third sections of both bills are practically identical and authorize the collection and examination of samples of Paints, Turpentine and Linseed Oil in the open market. Section 4 of the Marshall bill, which provides the procedure before the Secretary of Agriculture in the case of the detection of spurious products on the market, is adopted in the Dalzell bill, but modified so as to permit the accused manufacturer to introduce evidence at the hearings provided for, and it is further required that it shall appear from the evidence that the alleged violation of the law was unintentional.

The Dalzell bill adopts section 5 of the Marshall bill, which makes it the duty of each District Attorney to whom the Secretary of Agriculture shall report any violation of the act to cause appropriate proceedings to be commenced and prosecuted in the proper courts of the United States, but it eliminates the provision requiring district attorneys to act upon representations of "any health or food or drug officer or agent of any State, Territory or the District of Columbia, who shall present satisfactory evidence of any such violation."

Sections 6 and 7 of the Dalzell bill, which respectively define the term "Paint," and specify the method of labeling, differ materially from the Marshall bill and are as follows:

> Sec. 6. That the term "Paint" as used in this act shall include Oxide of Zinc, Red Lead and White Lead, dry or in any kind of Oil, and any compound intended for the same use, colors ground in Oil, paste or semipaste Paint, and liquid or mixed Paint ready for use.
>
> Sec. 7. That for the purposes of this act Paint shall be deemed to be improperly labeled unless the package containing it shall bear a label printed in the English language in plain legible type and stating thereon the following:
>
> (a) The name and residence of the manufacturer of the Paint, or of the distributer thereof, or of the party for whom the same is manufactured.
>
> (b) The name and, with substantial accuracy, the percentage of each ingredient, both solid and liquid, contained therein. In the case of Paint other than white Paint, where more than one coloring material is used, the several coloring materials may be shown by their combined percentage, in which case it shall be necessary to state the name and, with substantial accuracy, the chemical analysis of each of such constituent coloring materials.
>
> (c) The net measure of the contents of the container of all liquid or mixed Paint, and the net weight of the package of all paste and semipaste Paint sold by weight, or, if sold by measure, the net measure of such package.

Section 8 of the Dalzell bill provides that "for the purposes of this act Paint, Turpentine and Linseed Oil shall be deemed to be misbranded if the package containing it be marked or labeled in any manner so as to tend to deceive the purchaser as to its nature or composition or as to the net content of such package." The Marshall bill contains a more elaborate provision covering practically the same ground, but substitutes the term "improperly labeled" for "misbranded," as used in the Dalzell bill.

Section 9 of the Marshall bill protects from prosecution a dealer when he can establish a guaranty signed by the wholesaler, jobber, manufacturer or other party residing in the United States from whom he purchased the articles in question. The Dalzell bill elaborates this section to include both wholesalers and retailers, and adds painters to the category.

Sections 10 and 11 of the Marshall bill, which are purely administrative and prescribe the court procedure for the enforcement of the law, are adopted bodily in the Dalzell bill, as is also section 12, which defines the term "Territory" as including the insular possessions of the United States, and the word "person" as including corporations, companies, societies and associations. In both bills section 12 provides that "when construing and enforcing the provisions of this act the act, omission or failure of any officer, agent or other person acting for or employed by any corporation, company, society or association, within the scope of his employment or office, shall in every case be also deemed to be the act, omission or failure of such corporation, company, society or association as well as that of the person."

A new section is incorporated in the Dalzell bill providing that "the provisions of this act shall not apply to any Paint, Turpentine or Linseed Oil which has been manufactured, produced or sold prior to the time that this act takes effect."

Under the terms of the final section of the Marshall bill the proposed law would go into force six months from the date of its passage and approval, but in the Dalzell bill the statute would become effective "from and after the first day of July, 1909."

At the coming hearings before the Interstate and Foreign Commerce Committee Professor Ladd, the well-known North Dakota Paint expert, who was instrumental in securing the enactment of the law of that State which was recently held to be constitutional by the United States Supreme Court, will champion the Marshall bill and will oppose the most important changes suggested by the Dalzell bill. Dr. Harvey W. Wiley, chief of the Bureau of Chemistry of the Department of Agriculture, under whose supervision the Marshall bill was revised previous to its introduction, will also attend the hearings, and it is understood will urge a favorable report upon that measure.

Death of Philip Scheeler.

PHILIP SCHEELER, president of the Buffalo Wire Works Company, Buffalo, N. Y., died on March 16 after a very brief illness. Born in West Seneca, N. Y. (now a suburb of Buffalo), October 5, 1854, he received his education in the public schools of Buffalo, where he had lived continuously, and by his sunny temperament and genial disposition had made many friends, to whom his death came as a great shock. Mr. Scheeler started early in life to follow the footsteps of his father, who died six years ago, and who was the originator of the Wire Cloth and Wire Work business in that section of the country. When he attained the age of 16, he began to work for his father and learned the weaving and Wire Work business from the bottom up. In 1883 he became interested in the business with his father and brother, composing the firm of Scheeler & Sons. After a few years the two sons, with Ferdinand Grimm, succeeded, under the style of Scheeler's Sons. In 1903 the present corporation of the Buffalo Wire Works Company was formed, Mr. Scheeler being elected president. Mr. Scheeler was prominent in social and fraternal circles. He is survived by his wife and two sons, Philip M. and Charles A., also one brother, Martin, and four sisters, Mrs. Jacob Pfohl, Mrs. John L. Fischer, Mrs. Ferdinand Grimm and Miss Frances Scheeler.

PHILIP SCHEELER.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM F. E. WEINLAND, who is opening a new Hardware store at Bethlehem, Pa.

FROM SEMINOLE HARDWARE COMPANY, Seminole, Texas, which has been incorporated with a capital of $10,000.

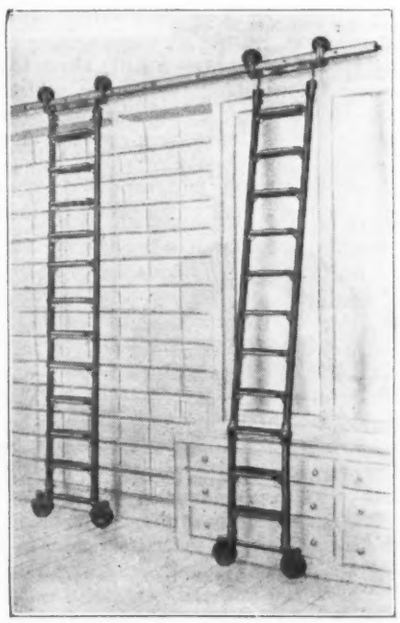
FROM JOHN HOENE, who is starting a Hardware store at Cottonwood, Idaho.

FROM S. W. KANADY, who has lately started a Hardware, Stove, Implement, Sporting Goods, and Saddlery store, at Denton, Texas.

FROM M. E. BROGAN, Portageville, N. Y., who has just built a new store, putting in a general line of Hardware, Saddlery, Vehicles, &c.

The Wilcox Rolling Store Ladder.

The Wilcox Mfg. Company, Aurora, Ill., has put on the market the Wilcox adjustable steel rolling store ladder, here shown, both bent and straight. The construction is such that all parts are interchangeable, and various lengths can be easily furnished. The ladder may be used straight or bent at the knuckle joint to conform to various angles necessitated by different projections of lower drawers or shelving. The ladders may be carried in stock by the merchant for instant delivery as conveniently as any other compact merchandise. The sides of round tubing are slotted to receive the ends of the steps, so that any hight of rise in inches can be obtained most acceptable to the user, the step being held rigidly by a set nut. Steps worn by excessive use or injured from any cause can be easily and quickly replaced with duplicate parts at moderate expense, thereby keeping the ladder practically new. Various lengths of ladder can be made on the extension principle. The malleable top and bottom brackets holding the rollers are also fastened with set screws. Regularly the ladders are finished a dead black, resembling in appearance the Bower-Barff finish, but both bronze and nickeled finishes can be supplied to harmonize with other store trim and fixtures.



The Wilcox Steel Rolling Store Ladder.

The Acme New Oval Pattern Cast Shear No. 701.

The Acme Shear Company, Bridgeport, Conn., is putting on the market oval pattern, straight and bent cast trimmers, with steel screw, as shown in Fig 1. These are spoken of as being well made, strong, highly finished, perfectly adjusted and beautiful in design. Each shear is oiled, wrapped in antirust tissue, placed in antirust pockets, packed half-dozen in neat box. In Fig. 2 is illustrated the emblem, registered in the United States Patent Office, used in connection with these shears.

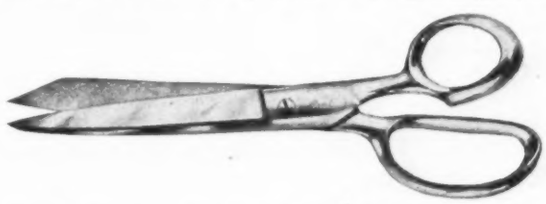


Fig. 1.—The Acme New Oval Pattern Cast Shear, No. 701.

Registered in U. S. Patent Office.

Fig. 2.—Emblem Used in Connection with the Acme New Oval Pattern Shears.

The Hardware firm of Lawson & Peterson, Rockford, Ill., has been succeeded by the Lawson-Peterson Hardware Company, which is incorporated with a capital stock of $10,000. The incorporators are William R. Lawson, Morton E. Peterson and P. A. Rosene.

Alcohol Gas Sad Iron.

The George L. Marion Mfg. Company, 129-131 Front street, New York, has perfected the self-heating laundry iron using denatured alcohol fuel, as here illustrated. Fig. 1 represents the flat iron as used, Fig. 2 showing the two working parts separated, with the combined burner and reservoir resting on the warming plate. In the depression of the steel plate a little alcohol is poured, the heat generated warming the burner, which in turn vaporizes the alcohol into a gaseous substance, producing an intense blue flame. Purchasers are cautioned to use denatured alcohol, not wood alcohol, as the latter not only has fewer heat units, but, vaporized, is especially injurious to the individual. The tubular brass burner

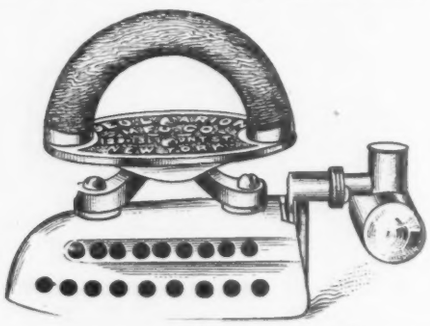


Fig. 1.—Self-Heating Flat-Iron, Using Denatured Alcohol.

with Bunsen attachment is ⅜ x 4 in., and perforated on both sides and bottom to heat adequately the iron where most needed. In two minutes the alcohol vaporizes and ironing temperature is reached in 10 to 12 minutes, with a maximum heat in about 15 minutes. The standard size, No. 2, weighs 6 lb. with reservoir filled, and is 7 in. long and 3 in. wide at rear, tapering gracefully toward the front and slightly beveled at the heel. The wood handle is protected from heat by an oval iron plate, 3⅜ x 5¾ in., insulated with asbestos mill board, both next the plate itself and at the two points of contact with body of iron, which is perforated alike on both sides. The seamless tube fuel tank has a removable top cap, and is of 1¾ x 3½ in. capacity, and partially filled with soft cotton candle wick. The one-piece burner and reservoir by lifting slightly can be instantly withdrawn from its place in the iron. The cooling effect of damp-

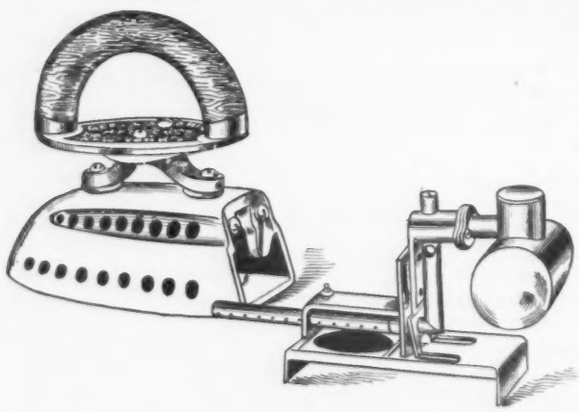
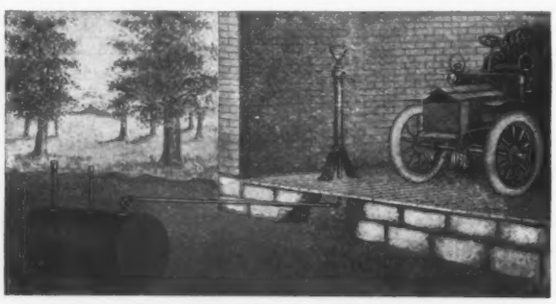


Fig. 2.—Burner Attachment on Warming Plate Device.

ened clothes on the temperature of the iron has been accurately determined; the heat generated being equal to the continuous demand on it. For ironing laces or other fabrics of any kind not moistened, consequently requiring less heat, the temperature can be easily reduced to prevent possible scorching by occasionally withdrawing the burner and resting it on the warming plate, which is struck up from one piece of 1-16 in. gauge steel, the top of which measures 2⅝ x 4¾ in. All metal parts, brass and iron, except warming plate, are finely polished and nickeled. The No. 1 is a smaller iron, suitable for boarders, tourists, &c., having 6 in. length of ironing surface, weighing 4 lb., and consuming 1½ oz. of alcohol in from 40 to 45 minutes. The No. 2, 6 lb., iron requires 4 oz. of alcohol in from 1½ to 2 hours. For convenience, either about the house or when traveling, portable black full leather cases, purple felt lined, are furnished. The front is hinged at bottom and top is hinged both back and front, the top and drop front being locked with a nickeled snap suit case catch. A 1 in. wide leather strap, sewed to each end of the case, with buckle, is used for carrying it. The larger case measures outside 5½ x 8 x 14½ in., the case for the No. 1 being proportionately smaller. Inside the case a sheet metal compartment at one end contains a filled pint glass alcohol flask and at the other end is a place for warming plate. Between the two the iron, properly braced, rests on a fixed ½ in. asbestos mat. There is also a removable asbestos mat or iron rest containing a supply of ironing wax. Some of the features of this device emphasized by the manufacturer, are: Safety, cleanliness, and uniformity in heat distribution; readiness for use in three to four minutes after alcohol gas is ignited; availability indoors or out, upstairs or down, independent of separate heat supply; freedom from odor, and cost, about a cent an hour, reckoned at 60 cents per gallon of denatured alcohol.

Underground Gasoline Tank and Pump Outfit.

The Wilson & Friend Company, 200 East Kinzie street, Chicago, Ill., is offering the underground gasoline outfit shown herewith. It consists of a tank and pump, necessary filler pipe and cap, vent pipe and cap; elbows and 20 ft. of pipe to connect tank and pump. The tank is made of heavy galvanized iron, and the pump of brass and iron, all wearing parts being brass, with no leather or rubber packing. It is a plain lift pump and is in-



Underground Gasoline Tank and Pump Outfit.

tended for use only where the gasoline does not have to be lifted over 8 ft. from the bottom of the tank to the spout of the pump, and the horizontal pipe is not over 30 ft. The company is prepared to furnish the tanks with rotary pumps, where the distance from the tank is too great, or where quick action is desired. The tank is designed to be buried from 12 to 24 in. below the surface of the ground, according to climatic conditions.

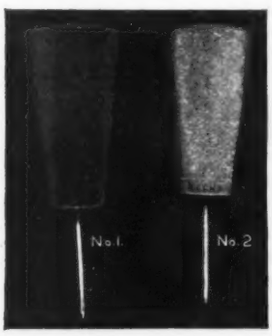
Screen Door Hinge No. 900.

Bommer Brothers, 255-271 Classon avenue, Brooklyn, N. Y., are putting on the market the recently patented screen door hinge, shown herewith. It has a covered coil spring made of the best oil tempered wire. The barrel is made of two sections, and this construction, it is explained, gives an additional bearing, so that the hinge always carries the weight of the door on two bearings, no matter which end is uppermost. It is pointed out that this arrangement doubles the strength of the hinge and doubles its wearing quality. It is well finished and attractive in appearance.

Screen Door Hinge No. 900.

The Peterson Cemetery and Lawn Vase.

The William F. Kasting Company, 383-387 Ellicott street, Buffalo, N. Y., is offering the vase shown herewith for holding cut flowers. It is made of tin, white enameled, with a spike in the bottom to stick in the ground, holding the vase in an upright position. The spike is substantially braced in the bottom of the vase, which is watertight. It is made in two sizes, Nos. 1 and 2, the No. 2 measuring 6¼ in. in hight and 3½ in. in diameter at the top. The No. 1 is somewhat larger in size. The vases are particularly designed for cemetery use in ornamentation of graves, and also for the decoration of lawns. They are simple and durable and present an attractive appearance. Holding a large quantity of water they keep the flowers fresh.



The Peterson Cemetery and Lawn Vase.

The Ball Safety Razor.

The new safety razor illustrated herewith is being put on the market by the O. V. Ball Cutlery Company, Bourse Building, Philadelphia, Pa. The razor is a three-piece one, consisting of a double edged hollow ground razor blade, the handle and the guard. The blade is made of the finest high carbon bar steel, hammer forged, double concaved and perfectly ground. It is made heavy, like

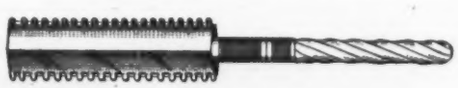


Fig. 1.—The Ball Safety Razor.

an ordinary razor, giving the necessary weight to insure the best shaving results. The blades rest flat upon the guard, and have a threaded shank which fits into a socket in the handle, by means of which the blade is held tightly in the guard and kept in perfect alignment. The blades are interchangeable, and two are furnished with each outfit, so that with the double cutting edges of each blade practically four razors are supplied. A stropping guard, into which the razor blades slide, and in which they may be firmly held by the handle during the operation of stropping is also supplied. The different parts of the Ball razor are made of white metal, heavily silver plated, and any part can be replaced at any time and a perfect fit insured. In using the razor the manufacturers claim that the weight of the blade makes it adaptable to both light and heavy shaving. Its construction enables it to be used as an ordinary razor, and it can be used with the sliding motion required for the proper and easy method of shaving. Either edge of the blade may be used, and the company claims that there is absolutely no danger of cutting the face. The razor is supplied with metal or pearl handle, neatly packed in a wooden box 1½ x 7½ in., velvet lined, and covered with grain leather, and has button fastening clasp. The razor is offered at a price which will allow both jobbers and retailers a good margin of profit. The part of the outfit shown separately at the bottom of Fig. 2 is the stropping guard. To strop the razor the blade is removed from the shaving guard and placed in the stropping guard. The handle is then screwed on tightly and the stropping done as with an ordinary razor. To strop the other side the blade is reversed.

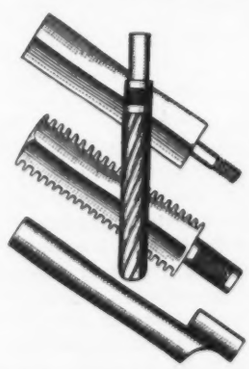


Fig. 2.—Different Parts of Ball Safety Razor.

Sopefount Shaving Brush.

The Posterity Company, 140 Commerce street, Newark, N. J., is manufacturing the Sopefount shaving brush and Sanitary shaving case, here shown. Fig. 1 is a phantom cut illustrating both the outer appearance of the nickeled handle to which the brush portion is screwed and the aluminum tube, 2¾ x ⅞ in., containing plastic soap of creamlike consistency. The brush proper is made of all pure imported badger hair or of blended hair, according to price. The hair is rubber set in a detachable screw cap, through the center of which is a small opening to permit entrance of soap tube, the contents of which is medically prepared and sealed by Johnson & Johnson, manufacturers of hospital supplies, for this purpose. In use the end thumb nut is given two or three turns to the right and pushed forward, causing sufficient soap to exude into the base of the brush for a shave. The thumb-piece operates a slender left-hand threaded rod, on the extreme end of which is an aluminum backed cork disk, which, as the disk recedes slightly on the rod and is then pushed forward, forces the substance into the brush in

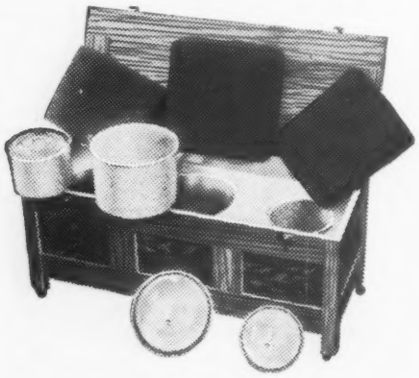
Fig. 1.—Sopefount Shaving Brush.

Fig. 2.—Nickeled Case for Brush and Razor.

wholesome sanitary condition to become lather by the addition of warm water. The bottom of the seamless tube handle is recessed ⅜ in., so the individual can conveniently reach the thumbnut and yet absolutely protect the contents of tube from possible contamination. There is an abundance of material for three months' average use, but when the tube is exhausted it may be thrown away and a new one under seal inserted. The brush itself is 2 in. long, and over all 1 x 5¾ in., weighing with soap tube complete 3 oz. The company also provide brush cases, listing but 25 cents each in aluminum, very light, measuring outside 1⅛ x 5½ in. There is also one of celluloid, ivory finish, 1¼ x 5¾ in., both of which have friction tight caps, ventilated, and all are noncorrosive. Fig. 2 is a seamless nickeled ventilated shaving case, 1½ x 6½ in., containing separate, removable compartments for both brush and standard razor, all of which are germproof and can be kept clean and sterile by scalding. The brush slides into a seamless tube by itself, and the razor has its own distinct space, spring controlled, to prevent movement or rattling about, the entire case with brush and soap weighing but 7 oz. The Sopefount brush is attractively put up in a double pasteboard box, with compartment for brush and separate space for the inner tube with soap; the latter an original package under seal until it reaches the consumer. The vulcanized rubber setting for brush prevents any shedding of hair.

Chatham Fireless Cooker.

The Manson Campbell Company, Detroit, Mich., is putting on the market the Chatham fireless cooker here shown. As now manufactured it has improvements of varied character on the cooker recently made. The cooker consists of an ornamental paneled hardwood, air-tight cabinet on casters. In use any food material, preferably cooked by boiling or steaming, may be placed in any or all of the three enameled ware cooking pots with covers and brought to a boil, 212 degrees F., in the usual way. The receptacles are then placed in the close fitting air-tight compartments, the close fitting pads, several inches thick, replaced, the chest lid closed and the food allowed to cook gradually and thoroughly for several hours, if necessary, by effectually retaining the heat first developed by any of the customary processes. All parts of the cabinet are thoroughly insulated, thus preventing



Chatham Fireless Cooker, Open.

dissipation of heat by radiation caused by lower surrounding temperature. Frozen mixtures, ice cream, &c., can be prepared and kept, by reversing the process. This method of cooking prevents the escape of odor except when the vessels are uncovered, thus retaining the aroma or flavor and natural juices. Fruits, vegetables, meats, &c., preserve shape, because there is no violent disintegrating boiling to break up their form. Fuel is greatly economized, especially if gas, kerosene, gasoline or alcohol is used for the starting operation, as that expense ceases shortly after it begins, instead of continuing for hours. There is no possibility of burning or scorching in the cabinet, boiling over, exhausting the moisture or need of care or vigilance. The insulating agents are upholstered in soft flannel and closely fitted around each compartment. The assertion is made by the company that food may be left in the compartments as long as 14 hours and still be hot, palatable and ready to serve.

The Fournier Automatic Weather Strip.

The accompanying illustrations represent weather strips offered by the Abel-Bauer Grille Mfg. Company, 423 Gratiot avenue, Detroit, Mich. As shown in Fig. 1

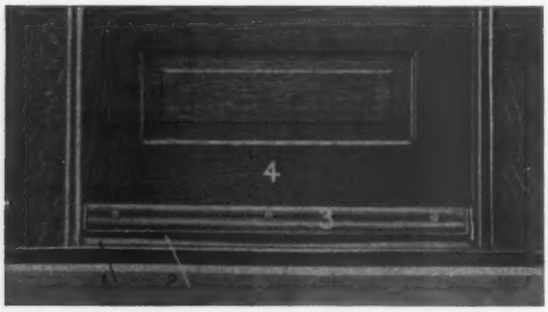


Fig. 1.—The Fournier Automatic Weather Strip.

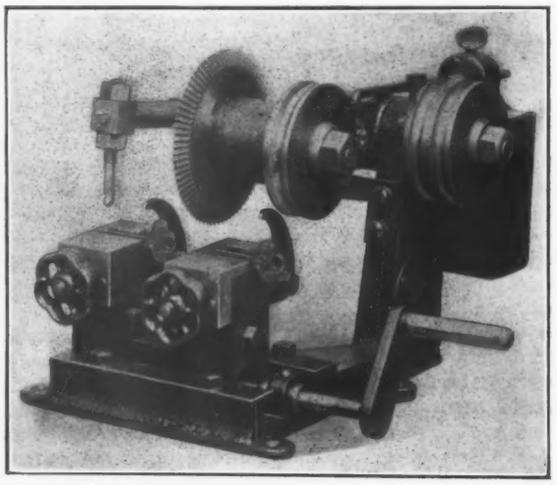
the design of the door strip is automatically to close the space between the door and threshold. The device is composed of a flexible rubber strip held firmly between two galvanized iron strips hung at each end to work automatically, and firmly secured in a neat molding. It is pointed out that the action of the device is perfect, as its purpose is accomplished by its own weight, not coming in contact with the threshold until the door is closed, and not rubbing on the carpet, floor or rug. It is explained that the strip will work equally well on a new threshold or one partly or wholly worn out; that it is airtight and rainproof, and not affected by ice or snow, and that it will last as long as the door to which it is

Fig. 2.—Copper Strip for Outside of Windows.

attached. In Fig. 2 is shown the company's copper weather strip for use on the outside of windows. The company also makes an oak weather strip for use on the inside of windows.

Taylor-Milligan Key Duplicating Machine.

Difficulties in the duplication of flat or so termed "Yale" keys have been entirely overcome, according to the claims made for the key duplicating machine, illustrated herewith. The machine described will cut any of the different makes of keys, having either U or V cuts, and make them accurately inside of one minute's time. The frame of the machine is of cast iron and is mounted on a wooden or metal table 24 in. square, and is operated by a foot treadle through a flywheel 26 in. in diameter by means of a round belt, the drive being through a loose pulley to a pulley on a short shaft, to which is attached a 4-in. milling cutter. The depth, width and direction of



Taylor-Milligan Key Duplicating Machine.

the cut are governed by a guide on an extended arm, which is held firmly in position by lock nuts and by means of a setscrew, and keyway is always maintained in a parallel position with the milling cutter, insuring a perfect cut at all times. The cutter itself is held against a collar on the shaft, so as to keep it also in perfect alignment with the guide. The milling cutter and guide are counterbalanced by an adjustable weight at the rear of the machine, so that the front of the machine can be swung back out of the way while the keys and blanks are being adjusted in the vises. To overcome variation in the key blanks, as may be found in those manufactured by different makers, interchangeable jaws are supplied for use with the various makes of blanks. These are held in the vises by means of screws and can be changed with ease and rapidity, and govern the depth of the cut as compared to the bottom groove in the key. The vises for holding both the master keys and the blanks are on a common bed, and have a lateral motion through a screw feed which is operated by a hand wheel at the right of the machine. After inserting the master key and blank in the vises, the position as to the depth to which they enter

the lock is determined by two gauges. These take the adjustment from the top of the keys, which gives the actual depth that the key enters the lock. The key and blank are then locked in the vises by means of the hand wheels at the front, the gauges are pushed back out of the way and the machine is ready for operation. In operating the machine the guide pin, which has a slightly rounded, hardened edge, so as to prevent wear, is held down on the master key by the hand. With the other hand the operator, by the crank at the right of the machine, gives the vises the lateral motion bringing the different portions of the key under both the guide pin and cutter, and the operation is completed in a very short time. The machine, patents on which have been applied for, is now being manufactured for the patentees, Taylor & Milligan, by Chester S. Leonard, 2322 Market street, Philadelphia, Pa. The machine will either be sold outright or leased, and is furnished with or without the table; countershaft for power drive can also be furnished with the machine if desired.

Kalor Gas Attachment.

The Willock Mfg. Company, 140 West Forty-second street, New York, has just got out the improved Kalor portable gas attachment here shown. This heating and cooking device can be used in a cook stove or brick set

Improved Kalor Portable Gas Attachment.

range, as well as independently by connecting it with the gas supply, using a flexible rubber tube, slipped over the ⅜-in. brass curved tube with ball joint. Anything that can be baked or roasted in a coal stove, gas range, &c., or boiled on top can be cooked with a Kalor. Some of the new features include a much better distribution of gas through the perforated sheet metal burners several inches in diameter and the prevention of flash backs. The Bunsen burner keys are now made about 2½ in. long, with upper corrugations or grooves to facilitate turning off the gas supply when hot without risk of burning the hand, a push with the poker being sufficient. The cast iron body is 10½ in. long and 5½ in. high, with bottom center tube ⅞ in. outside. When used in a firebox the burners can be raised by a brick or other support, so that the flame is close to the covers, and when inserted in an oven they can stand upright or lie on the side according to necessity, the oven door closing, except for the space required by the long curved brass jointed tube, thus allowing the escape of the products of combustion and ventilating the oven and simultaneously admitting oxygen from the surrounding atmosphere to support combustion. In the absence of coal or wood fire in the firebox the burners can be turned directly against the water back and heat water for the connected range boiler. With this attachment the ordinary stove or brick set range can be improvised instantly into a serviceable summer stove for quick results, and without having the constant unnecessary heat beyond immediate requirements, at the same time getting the advantage of top stove space and a better control of heat by dampers and flue connection when the Kalor is in the firebox.

The Lefever Arms Company.

With the completion of a large addition to its plant and the increased manufacturing facilities thus provided, the Lefever Arms Company, Syracuse, N. Y., will add the 16 gauge in the Durston Special and Durston Special Ejector grades fitted with Dura Nitro steel barrels. The company has heretofore furnished the 16 gauge in the H and higher grades only. The 20 gauge in the H grade, fitted with Carman fluid steel barrels, black, standard length of barrels and regular length of drops of stocks, will also be added. Previously the 20 gauge was to be had in the G and higher grades only. The 12 gauge H grade gun has previously been furnished fitted with best London twist barrels only. The company is now prepared to make immediate shipments of the H grade fitted with Carman fluid steel barrels, black, in addition to the twist barrels, and will be ready to make shipment after September 1 next of the 16 gauge in the Durston special grade and the 20 gauge in the H grade. The company has lately issued its 1908 catalogue giving full description of the different grades now manufactured.

Louden's New Wire Stretcher.

The Louden Machinery Company, Fairfield, Iowa, is offering the wire stretcher shown in Fig. 1 of the accom-

Fig. 1.—Louden's New Wire Stretcher.

panying cuts. The wire grips are fitted with raised flanges or guards to prevent absolutely wires slipping under the eccentric grips, while these, in turn, are fitted with a comparatively long handle, which has an offset curve to add to the convenience and power for setting the grip with the hand. The iron sheaves are made to turn on special steel thimbles to insure ease of operation and strength, and take rope full ⅜ in. in diameter. The sheaves are finished in bright vermillion, with gold retouching. When desired the stretcher can be fitted with hooks instead of grips, as in Fig. 2, for hoisting purposes. A feature of the device to which the company directs attention is that when stretching wire the operator stands away from the wire, out of danger; also that when used for hoisting purposes the operator is away from the load instead of under it.

Fig. 2.—Louden's Stretcher Fitted with Hooks.

THE McVOY-WESSLING HARDWARE COMPANY, wholesale Hardware, Chicago, which since its fire on December 26 has been doing business at 22 Lake street, is now re-established in its former quarters, 72-76 Lake street. All traces of the damage done by water and flames have been removed, and the company is now prepared to carry on its business with improved facilities.

New Styles of Yankee Screwdrivers.

The North Brothers Mfg. Company, Philadelphia, is offering several new styles of Yankee screwdrivers and their attachments. Fig. 1 shows the magazine ratchet screwdriver, No. 65, which has four interchangeable

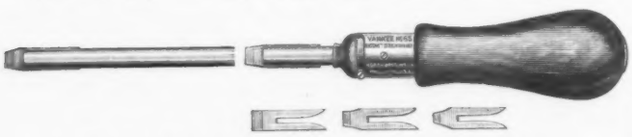


Fig. 1.—Magazine Ratchet Screwdriver with Blades.

blades easily removable and a magazine in the handle to hold them when not in use. As the four blades vary to suit different sizes of screws the one driver answers the place of four, affording a considerable saving in cost and much added convenience. The shank is of high quality steel, 11-32 in. in diameter, with the end grooved to correspond with forks on the blades and leaving a web of metal to connect the end, so that it is not weakened.

Fig. 2.—Holder with Blades for Use in Bit Brace.

The blades are of tool steel, an ingenious device holding them securely in place, although they may readily be pulled out with the fingers. When in use the magazine already referred to is flush with the end of the handle. The ratchet mechanism is for right or left hand and corresponds in material and workmanship with other tools of this company. This tool is made in two sizes, having 1¼ in. and 6 in. shanks, respectively. Fig. 2 shows a

Fig. 3.—Ratchet Screwdriver with Screw Holder Attachment.

screwdriver holder with four heavy blades for use in a bit brace. The length is 4⅞ in. Fig. 3 shows a ratchet screwdriver with screw holder attachment, which latter may be pushed back on the blade out of the way when not required, as shown in Fig. 4. The screw holder is intended to hold the screw, put it in place and to drive it especially in places difficult to reach and when one hand only can be used. The attachment consists of two jaws fastened to a head at one end with a ring to limit the spread of the jaws at the other end and a spring to operate them. When the screw is ratcheted in place the jaws will open as the head sinks into the wood so that the screw can be

Fig. 4.—Screw Holder Pushed Back on Blade.

driven in flush without having to unfasten the holder. It releases automatically. The company points out that in many places where it would be annoying to drop a screw in removal it can be partly turned out, the holder

Fig. 5.—Ratchet Screw Eye Driver.

slipped over it and removed in the holder. Fig. 5 illustrates a ratchet screw eye driver which is made in two sizes, No. 80, to hold No. 7 wire and smaller, and No. 81, to hold No. 11 wire and smaller. This tool consists of a regular ratchet driver with a holder or fork on the end

Fig. 6.—Bit with Screw Holder.

of blade. Outside there are two spring steel jaws fastened together at the lower end and kept in place by a surrounding ring which is fastened to the fork on the end of the blade. A spring between the fork and the lower end of the jaws keeps the latter in position to hold the screw eye as indicated in the illustration. The tool is equally valuable for driving or taking out screw eyes,

Fig. 7.—Bit with Screw Eye Holder.

especially in places where one hand only can be used. Figs. 6 and 7 show screw attachments for Yankee screwdrivers, the former being a longer bit than regular to fit drivers Nos. 30, 31, 35 and 20, sizes 1, 2 and 3. Fig. 7 shows a bit with screw eye holder made for Nos. 30 and 20, in size 2, to hold No. 8 and smaller screw eyes, and for Nos. 35 and 20, size 1, to hold No. 12 and smaller screw eyes.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal.
Linseed, State and Western, raw, in bbls.	.40 @42
City, Boiled, in bbls.	.44 @45
City, Raw, in bbls.	.43 @44
Raw, Calcutta, in bbls.	.70 @..
Lard, Prime, Winter	.65 @70
Extra No. 1	.55 @57
No. 1	.47 @52
Cotton-seed, Crude, f.o.b. mill	.31 @31½
Summer Yellow, prime	.40¼@40½
Summer White	.41¾@42
Yellow Winter	.42½@43
Tallow, Acidless	.57 @58
Menhaden, Brown, Strained	.41 @..
Light Strained	.41 @..
Northern	@..
Southern	@..
Cocoanut, Ceylon	℔ lb 6½@ 7
Cochin	℔ lb 7¾@ 8
Cod, Domestic, Prime	.42 @44
Newfoundland	.44 @46
Red, Elaine	.39 @40
Saponified	℔ lb 5¼@ 5⅝
Olive, Yellow	.67 @69
Neatsfoot, Prime	.55 @58
Palm, Lagos	℔ lb 6 @ 6¼

Mineral Oils—

	℔ gal.
Black, 29 gravity, 25@30 cold test	.13 @13½
29 gravity, 15 cold test	.13½@14
Summer	.12½@13
Cylinder, light filtered	.20½@21
Dark, filtered	.18 @19
Paraffine, 903-907 sp. gravity	.14½@15
903 sp. gravity	.13½@14
883 sp. gravity	.11 @11½
Red	.13½@14

Miscellaneous—

Barytes:	
White, Foreign	℔ ton $18.50@20.50
Amer. floated	℔ ton 19.00@20.00
Off color	℔ ton 13.00@16.50
Chalk, in bulk	℔ ton 3.00@ 3.40
China Clay, Imported	℔ ton 11.50@18.00
Cobalt, Oxide	℔ 100 lb 1.45@ 2.60
Whiting, Commercial	℔ 100 lb .42@ .52
Gilders	℔ 100 lb .55@ .60
Ex. Gilders	℔ 100 lb .60@ .65

Putty, Commercial—℔ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—℔ gal.

In Oil bbls.	.57½@58
In machine bbls.	.56 @58½

Glue—

	℔ lb
Cabinet	.12 @15
Common Bone	.7½@ 9
Extra White	.18 @24
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.20
Foot Stock, White	.12 @14
Foot Stock, Brown	.9 @11
German Common Hide	.10 @12
German Hide	.12 @18
French	.10 @40
Irish	.13 @16
Low Grade	.10 @12
Medium White	.14 @17

Gum Shellac—

	℔ lb
Bleached, Commercial	.23 @24
Bone Dry	.28 @29
Button	.40 @50
Diamond I	.47 @48
Fine Orange	.29 @32
A. C. Garnet	.23 @24
G. A. L.	.18 @19
Kala Button	.17 @18
D. C.	.48 @49
Octagon B	.38 @10
T. N.	.21 @23
V. S. O.	.47 @48

Colors in Oil—

	℔ lb
Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	@24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

	℔ lb
Lead, English white, in Oil	.10¼@10¾
Lead, American White:	
Lots of 500 lb or over, in Oil	@ 6¾
Lots less than 500 lb, in Oil	@ 7¼
Lead, White, in oil, 25 lb tin pails	@ 7¼
Lead, White, in oil, 12½ lb tin pails	@ 7¾
Lead, White, in oil, 1 to 5 lb assorted tins	@ 8¾

Lead, American. Terms: On lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice.

Zinc, Dry—

	℔ lb
American, dry	5¼@ 5⅝
(French process), Red Seal	6¾@ 7
(French process), Green Seal	7¼@ 7½
German (French process), Red Seal	6¾@ 7
Green Seal	7¼@ 7⅝
White Seal	7⅞@ 8¼
French, Red Seal	8¼@ 8¾
Green Seal	10½@10¾

Dry Colors—

	℔ lb
Black, Carbon	.6¼@10
Black Drop, American	.3½@ 8
Black Drop, English	.5 @15
Black, Ivory	.16 @20
Lamp, commercial	.4 @ 6
Blue, Celestial	.4 @ 6
Blue, Chinese	.31 @33
Blue, Prussian	.29 @31
Blue, Ultramarine	.3½@15
Brown, Spanish	.1@ 1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	.3½@ 5
Green, Chrome, pure	.17 @25
Lead, Red, bbls., ½ bbls., kegs.	@ 6¾
Litharge, bbls., ½ bbls., kegs.	@ 6¾
Ocher, American	℔ ton $8.50@16.00
American Golden	.2¼@ 3¼
French	.1¼@ 2
Foreign Golden	.3 @ 4
Orange Mineral, English	.10 @11
French	.12¾@13
German	.10 @11
American	.8½@ 8¾
Red, Indian, English	.4½@ 6
American	.3 @ 3¼
Red, Turkey, English	.4 @10
Red, Tuscan, English	.7 @10
Red, Venetian, Amer.	℔ 100 lb $0.50@1.25
English	℔ 100 lb $1.15@1.60
Sienna, Italian, Burnt and Powdered	.3 @ 9
Italian, Raw, Powdered	.3 @ 7
American, Raw	.1¼@ 2
American Burnt and Pow'd.	.1¼@ 2
Talc, French	℔ ton $18.00@25.00
American	℔ ton 15.00@25.00
Terra Alba, French	℔ 100 lb .90@ 1.00
English	℔ 100 lb .80@ 1.00
American	℔ 100 lb, No. 1. .75@ .80
American	℔ 100 lb, No. 2. .60@ .85
Umber, T'key, Bnt. & Pow.	.2¾@ 3
Turkey, Raw and Powdered	.2¾@ 3
Burnt, American	.1½@ 2
Raw, American	.1½@ 2
Yellow Chrome, Pure	.13 @15
Vermilion, American Lead	.7 @25
Quicksilver, bulk	.65 @..
Quicksilver, bags	@66
English, Imported	.65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ℔ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ℔ doz. pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils.....℔ lb @8¼¢
Hay-Budden, Wrought.....9½@9¾¢
Trenton .....℔ lb 9¼@9¾¢

Imported—

Swedish Solid Steel Sisco, Superior, ℔ lb.....10@10½¢
Peter Wright & Sons, ℔ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....10%

Augers and Bits—

Com. Double Spur....75&10@80%
Jennings' Patn., Bright.65&10@70%
Black Lip or Blued...65@65&5%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40&10%
Ford's Auger and Car Bits.....40&5%
Ft. Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list, 25&7½%
No. 30, R. Jennings' list.....50%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ℔ doz. $26; No. 2, $18.....60&10%
Ford's, Clark's Pattern.....66⅔&5%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00.....60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$6.50@7.00
Ames .....25&10%
Universal 20%

Ship Augers and Bits—

Ship Augers.....40&10@—%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' .....33⅓&7½
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.68@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles—Iron or Steel

Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose....3¾@4¼¢
No. 1½ Com., New Style..4½@5 ¢
No. 2 Solid Collar.....4½@5 ¢
Half Patent:
Nos. 7, 8, 11 and 12..65@65&10%
Nos. 13 to 14.....65@65&10%
Nos. 15 to 18.....70@70&10%
Nos. 19 to 22.....70@70&10%

Boxes, Axle—

Common and Concord, not turned lb., 5@6¢
Common and Concord, turned. lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait.....30%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg Balances.....50@50&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb..... per lb., —@2½@2¾¢

Towel -

No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—

Scale Beams.....40%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ℔ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....℔ doz. $1.50

Beaters, Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65. Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.50

Bellows—

Blacksmith, Standard List..
Split Leather.....60&10@65%
Grain Leather.....50@50&10%

Hand—

Inch.. 6 7 8 9 10
Doz..$5.00 5.50 6.00 6.50 7.50

Molders—

Inch.. 10 12 14 16
Doz..$7.50 9.00 12.00 15.00

Net Prices.

Bells—Cow—

Ordinary Goods...75&5@75&10&5%
High grade.....70&10@75%
Jersey .....75&10%
Texas Star.....50%

Door—

Home, R. & E. Mfg. Co.'s.....55&10%

Hand—

Polished, Brass.....50&10@60%
White Metal....50&10@50&10&5%
Nickel Plated.....50&5%
Swiss .....50&5%
Cone's Globe Hand Bells.....33⅓@35%

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School....60@60&5%

Belting—Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard .....70&5%
Light Standard.....75%
Cut Leather Lacing.....40&10%
Leather Lacing Sides, per sq. ft. 2½¢

Rubber—

Agricultural (Low Grade)..... 75@75&5%
Common Standard....70@70&10%
Standard .....70@70&5%
Extra .....60&5@60&10%
High Grade.....60&5@60&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden.....75@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....55%
Embossed 55%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co..... .....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):
⅝ × 6 and smaller.....75@—%
Larger and longer.....70@—%
Phila. Eagle, $3.00 list...80@—%
Bolt Ends.....70@—%
Machine (Cut Thread):
⅝ × 4 and smaller...75&5@—%
Larger and longer.....70@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:
Inch 3 4 5 6 8
Per doz..$0.30 .35 .45 .60 .80
Cast Iron Spring Foot, Jap'd:
Inch 6 8 10
Per doz.....$1.20 1.50 2.25
Cast Iron Chain, Flat, Japanned:
Inch..... 6 8 10
Per doz.....$1.00 1.40 1.65
Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch..... 6 8 10
Per doz.....$0.75 .95 1.25
Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....60&10%
Spring .....70&10@70&10&10%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square .....70&10&10%
Ives' Patent Door.....55%
Ives' Wrought Metal.....45%

Expansion—

Richards Mfg. Co.....50&10%
Steward & Romaine Mfg. Co.
Style No. 13, Double.....55%
Style No. 1, Single.....55%
Style No. 100, Dbl. Jaw, Single..50%
Lag Screw.....66⅔%

Plow and Stove—

Plow .....65&5@70%
Stove .....85@85&5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84..80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.....80%
Phila., Eagle, list Oct. 16,1884..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:
Inch..... 1¼ 1½ 1¾ 2
Per doz....$4.80 5.60 6.40 8.00
Inch 2¼ 2½
Per doz.....$8.65 11.50
Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 40%
Seavey 45%

Braces—

Common Ball, American....$1.50
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, $1 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat..60&10%

Brackets—

Wrought Steel.....70&10@75&10%
Bradley Metal Clasp..80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Brackets.....70&10%
Taplin Victor Handy Egg Beater Bracket .....℔ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—

M'f'gr's list, price per gross.
Quart..10 12 14
Water, Reg...25.35 28.00 32.00
Water, Hvy...45.35 48.00 52.00
Fire, Rd. Btm.32.00 34.65 38.65
Well 37.35 41.35 45.35

10&5%

Bull Rings—See *Rings, Bull*

Butts—Brass—

Wrought, High List, Oct. 26,'06.55%
Cast Brass, Tiebout's.....40%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—Bright.

Light Narrow, Light Reversible .....70&5%
Reversible and Broad..70&5%
Loose Joint, Narrow, Light Inside Blind, &c.....70%
Back Flaps, Table Chest..65%
Japanned.
Light Narrow, Loose Pin, 40&5%
Light Narrow, Ball Tip..60%
Broad .....40&5%
Steeple Tipped.....70%
Ball Tipped.....70%

Extra 10%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze; Series 700, 800..30%
Hendryx Enameled..... 35%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb., 4¼@4¾¢
Sharp, 1 prong, per lb., 4¼@5¼¢
Burke's, Blunt, 4@4¾¢; Sharp, 4½@5¼¢
Lautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B ..... 52@55¢
G. D..... *per M* 34@35¢
F. L..... *per M* 40@42¢
G. E..... *per M* 48@50¢
Musket ..... *per M* 62@63¢

Primers—

Berdan Primers, 32 per M..20&5%
Primer Shells and Bullets..15&10%
All other primers per M.$1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
32 C. F., $5.50..... 10&5%
38 C. F., $7.00..... 10&5%
22 cal. Rim, $1.50..... 10&5%
32 cal. Rim, $2.75..... 10&5%
B. B. Caps, Con. Ball, Swgd..$1.90
B. B. Caps, Round Ball....$1.49
Central Fire..... 25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting..... 50%
Rim Fire, Military..... 15&5%

Casters—

Bed ..... 65&10%
Plate ..... 60&5%
Philadelphia ..... 70&10%
Acme, Ball Bearing..... 35%
Gem (Roller Bearing).....70&10&10&5%
Steel Gem..... 20%
Standard Ball Bearing..... 45%
Yale (Double Wheel) low list..40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

3-16	¼	5-16	7-16	½	9-16
$8.65	*6.05*	*4.90*	*4.25*	*4.15*	*4.10*
⅝	¾	⅞ *to 1*	1⅛ *to 1¼ inch.*		
$4.05	*3.95*	*3.90*	*4.00*		

In cask lots, deduct 25¢.
German Coil..... 60@60&5%
German Pattern Coil:
6-0 to 1..... 70&5@70&10%
2 and 3..60&10&10@60&10&10&5%
4, 5 and 6.....50&10@50&10&5%

Halter—

Halter Chains..... 60@60&5%
German Pattern Halter Chains, list July 24, '97..... 60&10&5%
Covert Mfg. Co,
Halter ..... 55&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring..$28.00
6½—6-2, Straight, with ring..$29.00
6½—8-2, Straight, with ring..$32.00
6½—10-2, Str'ght, with ring..$37.00

NOTE.—Add 2c per pair for Hooks Twist Traces; add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.

Eastern Standard Traces, Wagon Chain, &c..60&10@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron ..... 60&10%
Brass 60%
Safety and Plumbers' Chain, 60&10%
Gal. Pump Chain....lb., 4½@5%
Bridgeport Chain Co.:
Triumph Halter and Coil..35&2½@40%
Triumph Dog.....50&10@60%
Brown Halter and Coil.....45@50&5%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 35&2½@40%
Niagara Dog Leads and Kennel Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain..... 70%
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain..... 60%
Pullman:
Bronze Chain, 60%; Steel Chain 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft..... $1.25@$3.00
Sash Ribbon Attachments, per set..8¢

Chalk—(From Jobbers.)

Carpenters' Blue....gro., 50@55¢
Carpenters' Red.....gro., 45&50¢
Carpenters' White...gro., 40@45¢

Checks, Door—

Bardsley's 45%
Pullman, per gro..... $54.00
Russwin 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....50%
Youths' Chests, with Tools.....35%
Gentlemen's Chests, with Tools..25%
Farmers', Carpenters,' etc., Chests, with Tools..... 20%
Machinists' and Pipe Fitters' Chests, Empty..... 45%
Tool Cabinets..... 45%
C. E. Jennings & Co.'s Machinists' Tool Chests..... 7½%

Chisels—

Socket Framing and Firmer

Standard List..... 80@—%
Buck Bros..... 30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....25&7½%
Socket Framing No. 15.....25&7½%
Swan's ..... 66⅔@70%
L. & I. J. White Co.....30@30&5%

Tanged—

Tanged Firmers.....30&5@35%
Buck Bros..... 30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co..... 25&5%

Cold— lb.

Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Almond Drill Chucks..... 35%
Almond Turret Six-Tool Chuck.....40%
Beach Pat., each $8.00..... 35&5%
Empire 25%
Blacksmiths' 25%
Jacobs' Drill Chucks..... 35%
Pratt's Positive Drive..... 25%
Skinner Patent Chucks:
Independent Lathe Chucks.....35%
Universal, Reversible Jaws.....35%
Combination, Reversible Jaws....35%
Drill Chucks, New Model, 25%; Standard, 45%; Skinner Pat., 25%; Positive Drive..... 40%
Planer Chucks..... 30%
Face Plate Jaws..... 35%
Standard Tool Co.:
Improved Drill Chuck..... 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combination, No. 83 and 84 ..... 30%
Geared Scroll, Nos. 33, 34 and 35..25%
Independent Iron, Nos. 18 and 318..35%
Independent Steel, No. 64.....25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104..... 35%
Union Czar Drill..... 25%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks..... 50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill..... 50%
Scroll Combination Lathe.....50%
Whitaker Mfg. Co.:
National Drill..... 25%

Clamps—

Adjustable, Hammers'.....20@20&5%
Carriage Makers', P., S. & W. Co, ... 50&10%
Besly, Parallel..... 33⅓&10%
Myers' Hay Rack..... 45%
Lineman's Swedish Neverturn.....65%
Wood Workers, Hammers'.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....50%
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel..℔ doz. $4.05 net
Star Shank, All Steel..℔ doz. $3.24 net
W. & C. Shank, All Steel, ℔ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros..... 30%
Fayette R. Plumb..... 30%
L. & I. J. White Co..... 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each..... $4.75
Stewart's Patent Sheep Shearing Machine, each.....$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75

Clips, Axle—

Regular Styles, list July 1, '05, 80&10&10%

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c. ..... 70@—%
Compression Bibbs..60&10@—%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list..... 40%
Leather, Walter B. Stevens & Son's list 40%

Compasses, Dividers, &c.

Ordinary Goods.....70&10@75%
Wm. Schollhorn Co.:
Excelsior Dividers..... 60%
Lodi Dividers.....70&10%

Conductor Pipe,—

	Gal. Steel.	*Charcoal.*
	L. C. L. to Dealers:	
Eastern	....70&10%	50&10&2½%
Pittsburgh	..75&10&5%	60%
Central	....75&10%	60%
Northwestern,	75&7½%	60%
Western	...70&12½%	50&12½%
Tennessee	..70&10%	50&12½%
Southern	... 70%	50&12½%
Southwestern,	70%	50&5%

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.

See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90

Galvanized, Lined, side handles,

Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled..... 10%
Agate Lined..... 10%

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 22@25¢; lighter than 3 lb. to pair.....24@27¢

Cord— Sash—

Braided, Drab..... *lb.* 35¢
Braided, White, Com., Nos. 8 to 12, 23¢; No. 7, 23½¢; No. 6, 24½¢. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....*lb.*, 11@11½¢
Cotton Sash Cord, Tw'ted.18@20¢
Patent Russia.....*lb*...20¢
Cable Laid Russia.....*lb*...21¢
India Hemp, Br'd'd.....*lb*...21¢
India Hemp, Twisted..*lb*.13@14¢
Patent India, Twisted...*lb*...17¢
Pearl Braided, cotton, No. 6, ℔ lb, 27½¢; No. 7, 26½¢; Nos. 8 to 12, 26¢
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to 10..... ℔ lb 23 ¢
Pullman:
Wire Sash Cord..... 10%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢
Massachusetts, White....℔ lb 40¢
Massachusetts, Drab.....℔ lb 45¢
Phoenix, White, Nos. 8 to 12, 27¢;
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906.....90@—%
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co, Wire Picture Cord ..... 85&10%

Cradles—

Grain ..... 40&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber, ℔ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks.....$10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $5.50; Light $5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden..... 50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ..... ℔ doz. $3.00
Wm. Rogers & Son..... ℔ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co..... 40%
Red Devil..... 60%
B. Mfg. Co..... 40%
Woodward 50%

Meat and Food—

American 30%

Nos.	401	402	403	404	405	406	407
Each ..	$5	$7	$10	$12	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

No. 202, $1.50..... 25@25&7½%
P., S. & W. Co.:
Dixon's ..... ℔ doz. 33⅓%

Nos...	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal ..... 40@40&5%
Hales ..... 60&10&5%
Little Giant..... ℔ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

New Triumph No. 605, ℔ doz, $24.00, 40&10%
Russwin Food. No. 1, $24.00; No. 2, $27.00 ..... 45&10&10%

	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters.....35%
Corn Graters..... 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater ..... ℔ doz. $4.00

Tobacco—

All Iron, Cheap..*doz.* $4.25@$4.50
Enterprise ..... 25@30%
National, ℔ doz., No. 1, $21; No. 2, $18 ..... 40%

Diggers, Post Hole, &c.—

Disston's:
Rapid, ℔ doz., $24.00..... 25%
Samson, ℔ doz., $34.00..... 25%
Iwan's Imp'ved Post Hole Auger..40%
Vaughan Pattern Post Hole Augers, ℔ doz., $7.00
Perfection Post Hole Diggers, ℔ doz. $8.75
Split Handle Post Hole Diggers, ℔ doz., $7.75
Hercules Pattern, ℔ doz.....$10.00
Kohler's, ℔ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer.....$7.50
Never-Break Post Hole Diggers, ℔ doz., $24.00..... 60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers.....35%
Sterling Wheel Dresser Cutters.....35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines ..... *$1.50@$1.75*
Breast, Millers Falls..... 15&10%
Breast, P., S. & W..... 33⅓%
Goodell Automatic Drills.50&10@60&10%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis..... 25%
Ratchet, Parker's..... 40%
Ratchet, Weston's..... 40%
Ratchet, Weston's, Style H Improved 40%
Ratchet, No. 012..... 40%
Ratchet, Celebrated..... 40%
Ratchet, Whitney's, P., S. & W., 50&5%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock..... 70@70&5%
Taper and Straight Shank..... 60&10@70%

Drivers, Screw—

Screw Driver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in. $9 ..... 50%
Buck Bros.' Screw Driver Bits.....30%
Champion 50%
Disston's 70%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto..... 65@65&10%
Mayhew's Black Handle..... 40%
Mayhew's Monarch..... 40%
Millers Falls, Nos. 20 and 21 ...25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
Smith & Hemenway Co., Neverturn, 66⅔%; Elmora, 60%; Star, 30&10%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*Gal. Steel.*	*Charcoal Iron.*
Eastern	....75&10&5%	60&20%
Pittsburgh	80&20%	65&10%
Central	...80&10&10&2½%	65&10%
Northwestern	80&10&10%	65&10%
Western	....80&10%	60&10&5%
Tennessee	..80&5%	60&10&5%
Southern	.. 80%	60&10&5%
Southwestern	75&10&2½%	60&5%

Terms.—2% for cash. Factory shipments generally delivered.

Note.—Lower prices are made in some sections.

See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I.
Standard Gauge....85@85&10%
No. 26..... 50%
No. 24..... 85%
No. 22..... 10%

Elbows, Stove Pipe—

Edwards, Standard Blue.....40&10&10%
Edwards, Royal Blue.....40&10&10%
Reeves, Dover, one piece.....40&10%

Emery, Turkish—

	4 to 4½:	*5 to 22:*	*Flour.*
Kegs .....*lb.*	5 ¢	5¼ ¢	5½ ¢
½ Kegs.....*lb.*	5¼ ¢	5¾ ¢	5¾ ¢
¼ Kegs.....*lb.*	5½ ¢	6 ¢	6 ¢
10-lb. cans, 10 in case....6¼ ¢		7 ¢	6 ¢
10-lb. cans, less than 10.....*10* ¢		10 ¢	8 ¢
Less quantity..*10* ¢		10 ¢	8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice

—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's .....50&10%
Walling's .....40&10%
Upson's Patent.....40%

Cord and Weight—
Ives and Titan.....33⅓%

Corrugated—
Acme Corrugated Fasteners.....70%

Faucets—
Cork Lined.....50&10@60%
Metallic Key, Leather Lined, 60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum .....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined...50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.....75&10@80%
Lower Grade...75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33⅓&10@40%

Fixtures, Fire Door—
Allith Underwriters' Approved.....50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz.	*$3.60*	*3.85*	*4.15*	*4.65*

P., S. & W. Co.....25%
Reading Hardware Co.....60%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion, Hay.....66⅔%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Wood Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp .....$2.75 } 10&12½%
Cotton .....3.20 }
Waterproof Sgl. Taped..3.65 }
Waterproof Dbl. Taped..4.40 }
Waterproof Tpl. Taped..5.15 }

Gates, Molasses and Oil—
Stebbins' Pattern.....80@80.65%

Gauges—
Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c..67½%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1. $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....65@65&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush..25&10@50%
Elwell's 40%

Grease, Axle—
Common Grade....gro. $6.00@6.50
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ℔ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....30%
Alundum Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50.....30%
Alundum Disc Grinders, each, $2.50 .....30%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ℔ inch, ℔ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....60&5@60&10%
Bridgeport Chain Co.:
Triumph Coil and Halters..35&2½@40%
Brown Coil and Halters...45@50&5%
Brown Cow Ties.....50&5@50&10&5%
Brown Tie Outs.....70&10@75&5%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35%
Sisal Rope.....20%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties....45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists'...55&10@55&10&5%
Heller's Farriers'.....40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....50%
Farriers' .....40&10&5%
Riveting 50%
Machinists', revised list.....66⅔&5%
Blacksmiths' .....50&5%
Fayette R. Plumb:
A. E. Nail.....40&2½@40&12½%
Eng. and B. S. Hand.50&10&5@60&5%
Machinists' Hammers.....60@60&10%
Rivet and Tinners'.40&7½@40&12½&5%

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 50¢.....80&10%
Over 5 lb., per lb., 30¢.....
Over 5 lb., per lb., 30¢.80&10&10%

Handles—
Agricultural Tool Handles
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted...gro. $3.00@$3.50
Brad Awl.....gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@$2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@$1.95; Hickory....$1.60@$1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz..30¢; Fore, doz..45¢.
Chapin-Stephens Co.:
Carving Tool.....30@30&10%
Chisel .....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle.....℔ gro, $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool, ℔ gro., No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00.....gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ℔ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 in., $2.50; 20 in., $2.70; 22 in. $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80. } 30
Sledge, ℔ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00. }
Axe ℔ doz., 28 to 34 in., $5.60; 36 in., $5.80. }
Adze, ℔ doz., 36 in., $5.80; 36 in., $7.80. }
Pick, ℔ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80. }
Hatchet, ℔ doz., 12 to 14 in., $2.00. }

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door.....50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&2½%
Roller Bearing.....70&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.08
Covered .....60&5%
Special .....70&5%
Lawrence Bros.:
Advance .....55&10%
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2.70%
Anti-Friction 60%
Hinged Hangers, King Charm.60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3. $2.25
Roller B'r'g St'l Track No. 12 $2.20
Roller B'r'g St'l Track No. 13 $2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22.—50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 41..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135 .....40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%
Myers' Stayon Hangers.....60%

Hangers— Garment—
Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro.....$10.50
Victor Folding.....℔ gro. $9.60

Gate—
Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—
Lane Bros. Co.....30%

Hasps—
Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ℔ doz..60%

Hatchets—
Regular list, first qual..40&2½&—
Second quality.....50&5&—

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. TD, $3.00; No. 3E, $3.25; No. 1, $3.50.....25%
Clark Coal, ℔ doz., $0.75.....20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Acme, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $2.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ℔ doz, sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Tip Pat'n, No. 1.....75&10%
No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking.....75&5%
Pioneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'chs.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch.....doz. ...@$2.00
Without Latch...doz. ...@$1.60
Reversible Self-Closing:
With Latch.....doz. ...@$1.75
Without Latch...doz. ...@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz. $1.15
Wrightsville Hardware Co.: Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....50%

Spring Hinges—
Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, Cast Iron $6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges.....40%
No. 999 Wrot. Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor..50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ℔ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ℔ gr. $12.00
Columbian Hinges.....60&10%
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Lawson Mfg. Co., Matchless.....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k, ℔ gr. pr.....$9.00
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%
Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges..50&10%
Heavy Strap Hinges..60&5%
Light T Hinges.....50%
Heavy T Hinges.....40%
Extra Hvy. T Hinges.50&10%
Hinge Hasps.....33⅓%
Cor. Heavy Strap...60&5%
Cor. Ex. Heavy T...50&10%
Extra 10&7½%.

Screw Hook and strap.
6 to 12 in..lb. 3½¢
13 to 20 in..lb. 3¼¢
22 to 36 in..lb. 3 ¢

Screw Hook and Eye:
¾ to 1 inch.....lb. 6½¢
⅝-inch.....lb. 7½¢
½-inch .....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross.

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$35*	*$39*	*$42*	*$46*
Jap. Open	*26*	*28*	*31*	*35*
Galv. Funnel	*44*	*48*	*52*	*56*
Jap. Funnel	*33*	*36*	*39*	*43*

10&5%

Masons' Etc.
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye—
Scovil and Oval Pattern..... 60&10@60&10&10%
Grub, list Feb. 28, 1899..... 70&10@70&10&10%

D. & H. Scovil.....27½%
Am. Fork & Hoe Co. (Scovil Pattern).....60%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit.....$3.20
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 40&5%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe, ℔ doz. 60&10%
Ft. Madison Dixie Tobacco Hoe.....75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.40
B. B., 6½ in.....$3.50
Acme Wedding.....℔ doz., net, $4.35
W. & C. L'tning Shuffle Hoe, ℔doz.$5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ℔ doz. $24.00.....45&10%

Door—

Bardsley's, Iron, 40%; Brass and Bronze.....25%
Empire.....50%
Pullman.....35%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50%
Superior.....33⅓%

File and Tool—

Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ℔ gross, $10.80; ℔ doz.....$1.25

Trace and Rein—

Fernald Double Trace Holder, ℔ doz. pairs.....$1.25
Dash Rein Holder, ℔ doz. pairs..$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45&20%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....40%

Wire—

Belt.....80%
Wire C. & H. Hooks....75@—%
Bradley Metal Clasp Wire, Coat and Hat, 70&10%; Ceiling.....70&10%
Columbian Hdw. Co., Gem.....70&5%
Parker Wire Goods Co., King..70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....*doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz.$3.00
Grass, common grades, all sizes, per doz.....*$1.50*
Whiffletrees, Cockeyes..lb.5¾@6¢
Hooks and Eyes:
Brass.....60@60&10%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net
Turner & Stanton Co. Cup and Shoulder.....80&10%
Bench Hooks—See Bench Stops, Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....*ft. 5@ 6¢*
3 ply Guaranteed.....*ft. 8@ 9¢*
4-ply Guaranteed.....*ft.10@11¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8@ 9¢*
Fair Quality.....*ft.10@11¢*

Irons— Sad—

From 4 to 10.....*lb. 3@3½¢*
B. B. Sad Irons.....*lb.3¼@3½¢*
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Tops	83	80	93	91
Tin'd Tops	88	85	98	95

New England Pressing..lb.3¾@4¢

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner.....60%

Pinking—

Pinking Irons.....*doz.60¢*

Irons, Soldering

See *Copners.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....50%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
Withington Acme, ℔ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....*80@—%*
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's.....66⅔@70%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz.$5.50@5.75
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Miscellaneous—

Farriers'.....*doz.$2.60@3.55*
Wostenholm's.....℔ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip.....*gro.$1.25@$1.40*
Carriage, Jap., all sizes.....*gro. 40@45¢*
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 100.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....20%
P. S. & W.....40&10%
Reading.....60%

Lanterns—Tubular—

Regular, No. 0.....*doz.$4.35@4.50*
Side Lift, No. 0.....*doz.$4.60@4.75*
Hinge Globe, No. 0.doz.$4.60@4.75
Other Styles.....*40@40&10%*

Bull's Eye Police—

3-inch.....*$4.25@4.50*

Latches— Thumb—

Roggin's Latches, with screw..*doz. 35@40¢*

Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co., No. 101, ℔ doz. $2.00
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Mallechable Iron, Pump—

See *Pumps—*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet.....	*$2.50*	*2.25*	*2.00*
75 feet.....	*$2.10*	*1.80*	*1.65*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $5.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton.....20%
Shade Cord, Cotton or Linen....20%

Locks— Cabinet—

Cabinet Locks.....*33⅓%*

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass, 55&5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 33⅓%.
Pullman Patent Ventilating Lock..35%
Reading Sash Locks.....40%

Machines—Boring—

Com. Upr't, without Augers, *$2.00@2.25*
Com. Angl'r, without Augers, *$2.25@2.50*
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power.... ℔ doz. $18.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist..30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone, High Speed Chain Hoist.....25%

Ice Cutting—

Chandler's.....12½%

Washing

Boss Washing Machine Co.: Per doz.
Boss No. 1.....$57.00
Boss Rotary.....$57.00
Champion Rotary Banner No. 1..$57.00
Standard Champion No. 1.....$50.00
Standard Perfection.....$27.00
Cincinnati Square Western.....$33.00
Uneeda American, Round.....$33.60

Mallets—

Hickory.....*45&5@50%*
Lignumvitæ.....*45&5@50%*
Tinners' Hickory and Applewood.....*doz. 45&5@50%*

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....30%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—

Divine's Red Devil.....30%
Lippincott's.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $2.25; 12-in., $2.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	14	16	18-in.
High Grade....	*$4.50*	*4.75*	*5.00*	*5.25*
Continental				60%
Great American				70%
Great American Ball B'r'g, new list.				70%
Quaker City				70%
Pennsylvania				60%
Pennsylvania, Jr., Ball Bearing, 50&10&5%				
Pennsylvania Golf				50%
Pennsylvania Horse				33⅓&5%
Pennsylvania Pony				40&5%
Granite State:				
Style A, Low Wheel				70%
Style B, Low Wheel				70%
Style C, High Wheel, spcl. list, 70&10%				
Style D, High Wheel, spcl. list.				70%
Philadelphia:				
Styles M., S., C., K., T.				70&10&5%
Style A, all Steel				60&10&5%
Style E, High Wheel				70&10&5%
Drexel and Gold Coin, special list.				40%
Horse				40&5%
Pony				40&5%
36-in. Horse				30&10%
Eagle Horse				30&5%
I. X. L. Horse				50%

Nails—

Wire Nails and Brads, Miscellaneous.....*87½@87½&10%*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Coleman	13	12	12	11	11	.....net
New Haven..	23	21	20	19	18	...40&5%
Livingston ..	19	18	17	16	16	.....10%
Western						℔ lb 8½¢

Jobbers' Special Brands.....*per lb.9@10¢*

Picture—

	1½	2	2½	3	in.
Brass H'd.	*.45*	*.55*	*.60*	*.70*	*.. gro*
Por. Head..	*1.10*	*1.10*	*1.10*		*.. gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: Off list.
Square, Blank or Tapped..5.80¢
Hexagon, Blank or Tapped.6.30¢
Square, Blank or Tapped, C., T. & R.....*5.60¢*
Hexagon, Blank or Tapped, C., T. & R.....*6.30¢*
Hot Pressed:
Square, Blank.....*5.80¢*
Hexagon, Blank.....*6.30¢*
Square, Tapped.....*5.30¢*
Hexagon, Tapped.....*5.90¢*

Oakum—

Best.....*lb., 6½¢*
U. S. Navy.....*lb., 6¢*
Navy.....*lb., 5¢*
Plumbers' Spun Oakum..2¾@3¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....*75%*
Chase or Paragon.
Brass and Copper.....*50&10%*
Zinc.....*65&10%*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%
Maple City Mfg. Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can— *Per doz.*

Sprague, Iron Handle....30@35¢
Sprague, Wood Handle...35@40¢
Sardine Scissors.....*$1.75@$3.00*
Yankee Can and Bottle Opener, ℔ doz., net, $0.75; Little Gem, ℔ doz., net.....$0.65

Egg—

Hartigan Nickel Plate, ℔ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope.....*20@25¢*

Rubber—

(Fair quality goods.)

Sheet, C. I.....*11@12¢*
Sheet, C. O. S.....*11@12¢*
Sheet, C. B. S.....*12@13¢*
Sheet, Pure Gum.....*40@45¢*
Sheet, Red.....*40@50¢*
Jenkins' '96, ℔ lb. 80¢.....25%

Miscellaneous—

American Packing...lb. 7@10 ¢
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute.....*lb. 4@ 4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.....*65&7½@70%*
Edwards, Royal Blue.....65&7½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz..	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz....	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: *lb.*
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.3½to6¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....*6¢*
Mill Board, Sheet, 40 x 40 in. 1-32 to ¼ in.....*.3@5¢*

Per roll

Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll *48@58¢*
Medium weight, 30 lbs. to roll, *56@70¢*
Heavy weight, 40 lbs. to roll.. *75@78¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....*$54.50*
Red Rope Roofing, 250 sq. ft. per roll.....*$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton.... *$34.00@$38.00*
2 ply, roll 108 sq. ft.....*65¢*
3 ply, roll 108 sq. ft.....*88¢*
Slater's Felt (roll 500 sq. ft.).*80¢*

Sand and Emery—

Flint Paper and Cloth.50&10@—%
Garnet Paper and Cloth....*25%*
Emery Paper and Cl'h..50&10@60%

Parers— Apple—

Goodell Co.:
Family Bay State.....℔ doz. $15.00
Improved Bay State.....℔ doz. $36.00
New Lightning.....℔ doz. $7.00
Turn Table '98.....℔ doz. $6.00
White Mountain.....℔ doz. $5.00
Bonanza Improved.....each $7.50
Dandy.....each $10.00
Eureka Improved.....each $20.00
New Century.....each $20.00
Ranger.....each $25.00
Livingston Nail Co.:
Daisy.....℔ doz. $4.00
Little Star.....℔ doz. $5.00
Rocking Table.....℔ doz. $6.20
Reading Hardware Co.:
Advance.....℔ doz. $4.00
Baldwin.....℔ doz. $4.00
Reading 72.....℔ doz. $3.25
Reading 78.....℔ doz. $6.25

Potato—

Saratoga.....℔ doz. $7.00
White Mountain.....℔ doz. $6.00

Picks and Mattocks—

(List Jan., 1908.)

List.....*70&10@70&10&10%*
Cronk's Handled Garden Mattock, ℔ doz., No. 2, $2.60; No. 3, $6.40.

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass .....50@50&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in......60&10@—%
Extra Heavy, 2-6 in...70&10@—%
Fittings, Standard and Heavy, 75&10@—%

Pipe, Merchant—

	Consumers, Carloads. Steel. Blk.	Galv.	Iron. Blk.	Galv.
	%	%	%	%
⅛ & ¼ in...	61	48	62	..
⅜ in.....	66	52	64	50
½ in.....	68	56	66	54
¾ to 6 in...	72	62	70	60
7 to 12 in....	69	54	67	52

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory:
First-class .....77@78%
Second-class .....80@81%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue....	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue.....	7.00	8.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color..	$6.15	$7.15
6 in., Uniform Color..	6.65	7.65
7 in., Uniform Color..	7.65	8.65

Planes and Plane Irons—

Wood Planes—
Bench, first qual.....$0@30&10%
Bench, second qual...40@40&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality.....30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and German.....30%
Union 60%

Iron Planes
Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06.....25%
Buck Bros.....30%
Chapin-Stephens Co.....25%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse.....per doz. $8.00

Plates—
Felloe .....lb. 4@4¼¢

Pliers and Nippers
Button Pliers....75&5@75&10&5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.

Gas Pipe..	7	8	10	12-in.
	$2.00	$2.25	$2.75	$3.50

Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....80%
Improved Button.....75&10%
Cronk's 60%
No. 80 Linemen's.....50%
Stub's Pattern.....45%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Paragon, 50%; Lodi, 55%.
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10%
Extension Sights.....30@30&10%
Machinists' Levels.....40@40&10%
Disston's Plumbs and Levels....60&10%
Disston's Pocket Levels.....60&10%
Stanley's Duplex.....30%
Woods' Extension.....33⅓%

Points, Glaziers'—
Bulk and 1-lb. papers....lb. 9 ¢
½-lb. papers.....lb. 9½¢
¼-lb. papers.....lb. 10 ¢

Police Goods—
Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—
Prestoline Liquid, No. 1 (⅛ pt.), per doz., $3.00; No. 2 (1 qu.), $9.00..40%
Prestoline Paste.....60%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, per doz. 50¢; per gro. $4.50; ½ lb boxes, per doz. $1.25; 1 lb boxes, per doz. $2.25.
U. S. Liquid, 8 oz. cans, per doz., $1.25.
Barkeepers' Friend Metal Polish, per doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, per lb 10¢
Black Eagle, Liquid, ½ pt. cans.. per doz. 75¢
Black Jack Paste, ¾ lb cans, per gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, per gr. $5.75.....10%
Dixon's Plumbago.....per lb 8¢
Fireside .....per gr. $2.50
Gem, per gr. $1.50.....10%
Japanese .....per gr. $3.50
Jet Black.....per gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. per doz. $1.50

Poppers, Corn—
1 qt. Square..doz.$0.80; gro.$8.75
1 qt. Round..doz.$0.90; gro.$10.00
1½ qt. Square.doz.$1.00; gro.$11.00
2 qt. Square..doz.$1.25; gro.$13.50

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled .....35&10%
Tinned .....50&10%

Powder—
In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk).....	$12.00	$15.00
Half Keg (12½ lb bulk)...	6.25	7.75
Quarter Keg (6¼ lb bulk).	3.25	4.00
Case 24 (1 lb cans bulk)..	14.00	17.00
Half case 12 (1 lb c. bk)..	7.25	8.75

Presses—

Fruit and Jelly—
Enterprise Mfg. Co.....20@25%

Seal Presses—
Morrill's No. 1, per doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail—
Cyclops 50%
Miller's Falls, No. 3, per doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, per doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
The Scranton Co. Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B.....70%
Giant 50%
Staple Pullers, Utica and Davison 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye. doz., 4 in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz.	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz.	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in.....17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in....20@21c
Acme, No. 35..1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle .....50&10%
Wrought Steel, Eagle.....17@20¢
Fox-All-Steel, Nos. 3 and 1, 2 in.. per doz. 50%
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1¾ in., 19¢; 2 in.....20½¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26..1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—
Cistern 60%
Pitcher Spout.....75&5@75&10%
Wood Pumps, Tubing, &c....50%
Barnes Dbl. Acting (low list)....40&5%
Barnes Pitcher Spout.....5&10%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....per doz. $6.50
Flint & Walling's, Fast Mail Hand, (low list).....50%
Flint & Walling's Fast Mail (low list) 50%
Flint & Walling's Tight Top Pitcher. 75&10%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50.....30%
Myers' Pumps (low list).....40&5%
Myers' Power Pumps.....40&5%
Myers' Spray Pumps.....40&5%

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.....	*1*	*2*	*3*	*4*	
	$5.00	6.00	7.00	8.00	50%
Cup Leathers—Per 100:					
Inch....	*2½*	*3*	*3½*	*4*	
	$5.00	7.00	9.00	12.00	

Punches—
Saddlers' or Drive, good.....doz. 50@75¢
Spring, single tube, good quality $1.75
Revolving (4 tubes)....doz.$3.50
Dennis & Call Co.'s Cast St'l Drive.50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi.....55%
Tinners' Hollow, P., S. & W. Co..40%
Tinners' Solid, P., S. & W. Co., doz., $1.44.....40%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..per ft. 3¼¢
O. N. T. Rail.....$3.12
Griffin's:
xxx, per 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, per 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, per 100 ft. $3.45
O. N. T., per 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1⅛ in., $4.00.
Standard, 1¼ in.....per 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., per 100 ft., $7.50; 1¼ x 3-16 in., $8.75.....55&7½%
McKinney's:
Hinged Hanger Track, per ft., 11¢; 60&5%
1 x 3-16 Track.....55&7½%
Myers' Stayon Track.....60&5%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, per ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor.....80&25%
Queen City Lawn, per doz., 20 teeth, $2.85; 24, $3.00.....net
Anticlog Lawn, per doz.....$4.00
Malleable Garden.....70&10%
Ideal Steel Garden, per doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00.....80%
Kohler's:
Lawn Queen, 20-tooth....per doz. $3.15
Lawn Queen, 24-tooth....per doz. $3.25
Paragon, 20-tooth.....per doz. $2.70
Paragon, 24-tooth.....per doz. $2.75
Steel Garden, 14-tooth....per doz. $2.40
Malleable Garden, 14-tooth, per doz. $2.00@2.25

Rasps, Horse—
Disston's 75%
Heller Bros.'.....70&5@70&10&5%
Liveright Bros.' Gold Medal.70&10@75%
McCaffrey's American Standard, 60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—
Liana Bo-ras-ic.....60%
Fox Razors, per doz., No. 42, $28.00; No. 44, $20.00; No. 82, Platina, $25.00. } 40%
Red Devil.....65%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9½, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze 25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 98 PN.....20%
2904 P, 33⅓%; 2904 PN, 33⅓%; 0924 N, 33⅓%; 02084 N, 33⅓%; 002904 PN, 33⅓%; 802 N, 33⅓%.
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed .....70@70&10%
White Porcelain Enamel..50&10%
Solid Brass or Bronze Metal.40%

Revolvers—
Single Action.....$5@$31.00
Double Action, except 44 cal..$2.00
Double Action, 44 caliber....$2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in.....per doz.$2.50@$2.75
17 in.....per doz.$2.75@$3.00
18 in.....per doz.$3.00@$3.25

Rings and Ringers—

Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.10	1.25	1.65 doz.

Hog Rings and Ringers—
Hill's Rings, gro. boxes....$4.25
*Hill's Ringers, Gray Iron, doz.*60¢
*Hill's Ringers, Malleable Iron, doz.*80¢
Blair's Rings.....per gro.$5.00
Blair's Ringers.....per doz.75¢
Brown's Rings.....per gro.$5.25
Brown's Ringers....per doz.75¢

Rivets and Burrs—
Copper 50%
Carriage, Coopers', Tinners, &c.: Black .....70&10%
Metallic Tinned.....70%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@25¢; Tin boxes, 100 count, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—
Cronk's Stay, No. 50.....$1.00
Cronk's Brickerhoff No. 55, $0.60; No. 56, $0.75; No. 60.....$0.75
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%

Rope—
Manila, 7-16 in. diam. and larger: Pure .....lb., 10½@11½¢
Sisal, 7-16 in. diam. and larger: Pure .....lb., 7½@8¢
Sisal, 7-16 in. diam. and larger: No. 2 quality.....lb., 6½@7¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed .....lb., 6½@7¢
Pure .....lb., 7¾@8¼¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Intermediate: Mixed .....lb., 5¼@5¾¢
Pure .....lb., 6½¢
Cotton Rope: Best, ¼-in. and larger...18@20¢
Medium, ¼-in. and larger.16@17¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. & up, lb., 6¼¢
Thread, No. 2, ¼-in. & up, lb., 5¾¢

Wire Rope—
Galvanized .....37½&2½%
Plain .....45&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal.....20%

Rules
Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory .....25@25&10%
Miscellaneous .....50@50&10%
Stephens' Combination.....55%
Stationers' .....50@50&10%
Kenffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....50&10%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
- Circular 45%
- Band ..... 50@50&10%
- Butcher Saws 50%
- Cross Cuts 35%
- One-Man Cross Cut 40%
- Narrow Cross Cut 50%
- Hand, Rip and Panel ..... 35&5%
- Miter Box and Compass 40%
- Mulay, Mill and Drag 45%
- Wood Saws ..... 40&10%

Chapin-Stephens Co.:
- Turning Saws and Frames ..30@30&10%

Diamond Saw & Stamping Works:
- Sterling Kitchen Saws ..... 30&10&10%

Disston's:
- Circular, Solid and Ins'ted Tooth. 50%
- Band, 2 to 18 in. wide 60%
- Band, ¼ to 1⅝ 60%
- Crosscuts 45%
- Narrow Crosscuts 50%
- Mulay, Mill and Drag 50%
- Framed Woodsaws 25%
- Woodsaw Blades 25%
- Woodsaw Rods, Tinned 15%
- Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
- Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
- Compass, Key Hole, &c. 25%
- Butcher Saws and Blades 30%

C. E. Jennings & Co.'s:
- Back Saws 16⅔%
- Butcher Saws ..... 25&7½%
- Compass and Key Hole Saws, 33⅓&7½%
- Framed Wood Saws ..... 25&7½%
- Hand Saws 12½%
- Wood Saw Blades ..... 33⅓&7½%

Millers Falls:
- Butcher Saws ..... 15&10%
- Star Saw Blades ..... 15&10%

Massachusetts Saw Works:
- Victor Kitchen Saws ..... 40&10&50%
- Butcher Saws Blades .. .. 35@40%

Peace & Richardson's Hand Saws ... 30%

Simonds':
- Circular Saws 45%
- Crescent Ground Cross Cut Saws .. 30%
- One-Man Cross Cuts ..... 40&10%
- Gang Mill, Mulay and Drag Saws. 45%
- Band Saws 50%
- Back Saws ..... 25@25&7½%
- Butcher Saws ..... 35@35&7½%
- Hand Saws ..... 25@25&7½%
- Hand Saws, Bay State Brand 45%
- Compass, Key Hole, &c. .25@25&7½%
- Wood Saws ..... 40&7½%

Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A .. 35%

Disston's:
- Concave Blades 25%
- Keystone Blades 35%
- Hack Saw Frames 30%

Simonds File Co. 35%

C. E. Jennings & Co.'s:
- Hack Saw Frames, Nos. 175, 180 .... 40&7½%
- Hack Saws, Nos. 175, 180, complete, 40&7½%

Goodell's Hack Saw Blades ..... 40&10%

Griffin's Hack Saw Frames .. 35&5&10%

Griffin's Hack Saw Blades .... 35&5&10%

Star Hack Saws and Blades ..... 15&10%

Sterling Hack Saw Blades .... 30&10&5%

Sterling Hack Saw Frames .. 30&10&10%

Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 .. 10%

Victor Hack Saw Blades 20%

Victor Hack Saw Frames 40%

Whitaker Mfg. Co.:
- National Hand Blades 40%
- National Hand Frames ..... 30&5%
- National Power Blades ..... 30&10%

Scroll—

Barnes, No. 7, $15 ..... 25%

Barnes' Scroll Saw Blades 40%

Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%

Lester, complete, $10.00 ..... 15&10%

Rogers, complete, $3.50 and $4.00 .. 15&10%

Scales—

Family, Turnbull's .... 50@50&10%

Counter:
- *Hatch, Platform, ½ oz. to ¼ lbs. ..... doz., $5.50*
- *Two Platforms, ½ oz. to 8 lbs. ..... doz., $16.00*
- *Union Platform, Plain. $1.70@1.90*
- *Union Platform, Stpd. $1.85@2.15*

Chatillon's:
- Eureka 25%
- Favorite 40%
- Crocers' Trip Scales 50%

The Standard Portables 40%

The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle ..... doz. $2.00@2.25

Box, 2 Handle ..... doz. $2.50@2.60

Ship .... Light, $2.00; Heavy, $4.50

Chapin-Stephens Co.. Box ... 30@30&10%

Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1⅛, $3.00@3.25; 1¼, $3.50@3.75

Bench, Wood ..... 20@20&10%

Hand, Wood ... 70&10@70&10&10%

Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—

Lag, Cone Point ..... 80@80&5%

Coach, Gimlet Point, 75&10@75&10&5%

Hand Rail ..... 70&10@75%

Jack Screws—

Standard List ..... 70&10@75%

Millers Falls ..... 50&10&10%

Swett Iron Works ..... 70@75%

Machine—

Cut Thread, Iron, Brass or Bronze:

Flat Head or Round Head, 50@50&10%

Fillister Head ..... 40@40&10%

Rolled Thread, F. H. or R. H., Iron ..... 75&10%

F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%

Set (Steel), net advance over Iron 25%

Sq. Hd. Cap ..... 70&10&7½%

Hex. Hd. Cap ..... 70&10&7½%

Rd. Hd. Cap ..... 50&7½%

Fillister Hd. Cap ..... 60&7½%

Wood—

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Flat Head, Iron ..... 87½&5@.. %

Round Head, Iron ..... 85&5@.. %

Flat Head, Brass ..... 80&5@.. %

Round Head, Brass .. 77½&5@.. %

Flat Head, Bronze .... 75&5@.. %

Round Head, Bronze. 72½&5@.. %

Drive Screws ..... 87½&5@.. %

Scroll Saws—

See *Saws, Scroll.*

Scythes— *Per doz.*

Grass, No. 1, Plain .... $7.00@7.50

Clipper, Bronzed Webb. $7.25@7.75

No. 3 Clipper, Pol'd Webb .. $7.50@8.00

No. 6 Clipper and Solid Steel, $7.75@8.25

Bush, Weed and Bramble, Nos. 11, 12 and 13 ..... $7.25@7.75

Grain, No. 1 ..... $9.00@9.50

Bronzed Webb, No. 1 ... $9.25@9.75

Nos. 3 and 4 Clipper, Grain .. $9.50@10.00

Solid Steel, No. 6 .... $10.00@10.50

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%

Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 .. 20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ℔ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75

Buck Bros. 27½%

Cannon's Diamond Point, ℔ gro. $12 .. 40&10%

Mayhew's ..... ℔ gro. $9.00

Snell's Corrugated, Cup Pt. .... 40&10%

Snell's Knurled, Cup Pt. ..... 40&10%

Victor Knurled Cup Pt. ... ℔ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
- Criterion 40%
- Adjustable 40%

Disston's Star, Monarch and Triumph 30%

Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
} 50%

Giant Royal Cross Cut ... ℔ doz. $8.00

Royal, Hand ..... ℔ doz. $4.50

Taintor Positive ..... ℔ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 ..... ℔ doz., net, $24.00

Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
- Fast Cut Pocket Knife Hones, ℔ doz $1.50
- Mounted Kitchen Sand Stone, ℔ doz $1.50
- Natural Grit Carving Knife Hones, ℔ doz $3.00
- Quick Cut Emery Carving Knife Hones, ℔ doz $1.50
- Quick Edge Pocket Knife Hones, ℔ doz $2.00

} 50%

Skate—

Smith & Hemenway Co., Eureka .. 50%

Shaves, Spoke—

Iron ..... doz. $1.25

Wood ..... doz. $2.00

Bailey's (Stanley R. & L. Co.) 45%

Chapin-Stephens Co. ..... 30@30&10%

Goodell's, ℔ doz. $9.00 ..... 15&10%

Shears—

Cast Iron..	7	8	9 in.	
Best	*$16.00*	*18.00*	*20.00*	*gro.*
Good	*$13.00*	*15.00*	*17.00*	*gro.*
Cheap	*$5.00*	*6.00*	*7.00*	*gro.*

Straight Trimmers, &c.:

Best quality Jap .... 70@70&10%

Best quality, Nickel .. 60@60&10%

Tailors' Shears ..... 40@40&10%

Acme Cast Shears ..... 40@40&5%

Heinisch's Tailor's Shears 10%

Wilkinson Shear & Cutlery Co.:
- Sheep, 1900 list ..... 30&10&5%
- Grass ..... 50&10%
- Horse or Mule ..... 50&10%

J. Wiss & Sons Co.:
- Best Quality Jap'd ..... 60&10%
- Best Quality Nickeled ..... 50&10%
- Tailors' 25%

Tinners' Snips—

Steel Blades ..... 20&5@20&10%

Steel Pat. Hd Blades ..... 40&10@50%

Forged Handles, Steel Blades, Berlin .. 50%

Heinisch's Snips 40%

Jennings & Griffin Mfg. Co.'s 6½ to 10 in. ..... 33⅓&7½%

Niagara Snips 40%

P., S. & W. Forged Handles, 25%; W. R. W. ..... 40&10%

J. Wiss & Sons Co.:
- Wiss Forged Steel 25%

Pruning Shears—

Cronk's Hand Shears 33⅓%

Cronk's Wood Handle Shears 33⅓%

Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00 ..... 25%

Disston's Pruning Hook only, ℔ doz., $12.00 ..... 25%

John T. Henry Mfg. Co.:
- Pruning Shears, all grades 40%

P., S. & W. Co. ..... 40&10%

Columbian Cutlery Co.:
- Hedge, Wilcut Brand ..... 60&10%
- Lawn and Border, Wilcut Brand. 60&10%

Sheaves—Sliding Door—

Reading 40%

R. & E. list 15%

Sliding Shutter—

Reading list 40%

R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
- Climax, 10 and 12 gauge ..... 65&10%
- Club, Rival, 65&5%; First Quality, 60&5%

Paper Shells, Empty:
- New Rapid, 10, 12, 16 and 20 gauge, 25&10%
- Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
- Union, League, 12 and 12 gauge; Rival Grade 25%
- New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
- Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade .. 20%

Shells, Loaded—

Loaded with Black Powder .. 40%

Loaded with Smokeless Powder, medium grade ..... 40&5%

Loaded with Smokeless Powder, high grade ..... 40&10&10%

Union Metallic Cartridge Co.:
- New Club, Black Powders 40%
- Nitro Club, Smokeless Powders. 40&5%
- Arrow, Smokeless Powders. 40&10&10%

Winchester:
- Smokeless Repeater Grade ..... 40&5%
- Smokeless Leader Grade ... 40&10&10%
- Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:	Painted,	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:
- Dixie, 14 x 20 in. ... $4.25 — $5.50
- Dixie, 10 x 14 in. .... 4.50 — 6.00
- Dixie, 7 x 10 in. .... 5.00 — 6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:

Iron ..... per keg. $4.10

Steel ..... per keg. $3.85

Burden's, all sizes ..... ℔ keg $3.90

Shot—

25-lb. bag.

Drop, up to B $1.85

Drop, B and larger 2.10

Buck 2.10

Chilled 2.10

Dust 2.30

Shovels and Spades—

Association List, Nov. 15, 1902 .. 40%

Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... $3.25@$3.50

Wood and Mall. D. Handle, $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50@10.00

Hunter's Genuine ..... per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; ℔ doz. $39.00

Sieves, Seamless Metallic

	Per dozen.			
Mesh	*14*	*16*	*18*	*20*
Iron Wire	*1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.

Mesh 18, Nested .... doz. $0.90@0.95

Mesh 20, Nested .... doz. $1.00@1.05

Mesh 24, Nested .... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:

12 x 12 to 22 x 36 in 60%

20 x 40 to 24 x 50 in 50%

24 x 60 to 24 x 120 in 30%

Barnes' low list:
- Up to and including 20 x 36 in 50&5%
- 20 x 40 to 24 x 50 in 45%

NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@75&10%

Steel ..... 40@45%

Slates, School—

Factory Shipments.

"D" Slates ..... 50@50&10%

Eureka, Unexcelled Noiseless .. 60&5 tens

Victor A, Noiseless. 60&4 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%

Covert Mfg. Co.:
- Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
- High Grade, 40%; Trojan 40%
- Jockey 25%

Snaths—

Scythe ..... 55@60%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10@60&5%

Cheap ..... 60@60&10%

International Silver Co.:
- 1847 Rogers Bros., 40&10%; Rogers & Hamilton ..... 50&10%
- Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
- Anchor, Rogers Brand 60%
- Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50¢@55¢

Tables ..... per gro. $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check 40%

Chicago (Coil) ..... 40&10%

Gem (Coil) 20%

Pullman (Coil) 35%

Reliance (Coil) ..... 40&10%

Star (Coil) 30%

Torrey's Rod, 39 in. ..... ℔ doz. $1.10

Carriage, Wagon, &c.—

1¼ in. and Wider: Per 100 lb.

Black ..... $4.75@$5.00

Half Bright ..... $4.75@$5.00

Bright ..... $5.25@$5.50

Painted Seat Springs:

1½ x 2 x 26 ..... per pr. 49@52¢

1½ x 3 x 28 ..... per pr. 73@77¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
- Cactus, 65%; Japanese, 70%; National, ℔ doz. $12.00

Enterprise ..... 25@30%

Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated .. } List Jan. 5, 1900.

Steel and Iron. } 80@80&5%

Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%

Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%

Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Porcelain Lined:

Cheap ..... doz. $1.00

Good Grade ..... doz. $1.25

Tinned Iron ..... doz. $0.75@1.25

Iron, Porcelain Lined ... doz. $1.75

Staples—

Barbed Blind ..... 85&5@85&10%

Electricians' ..... 80&10&10@85%

Fence Staples, Plain, $2.15; Galvanized $2.45

Poultry Netting Staples ..... per lb. 3¼@3½¢

Steels, Butchers'—

Dick's 30%

Foster Bros.' 30%

Steelyards — .... 30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%

Curtis Rev'ble Ratchet Die Stock .. 25%

Derby Screw Plates 25%

Green River 25%

Lightning Screw Plate 25%

Little Giant 25%

Reece's New Screw Plates 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

	℔ lb	
Pike Mfg. Co., 1907 list:		
Arkansas St. No. 1, 3 to 5½ in.	$2.80	33⅓%
Arkansas St. No. 1, 5½ to 8 in.	$3.50	
Arkansas Slips No. 1	$4.00	
Lily White Washita, 4 to 8 in.	60¢	
Rosy Red Washita, 4 to 8 in.	60¢	
Washita St., Extra, 4 to 8 in.	50¢	
Washita St., No. 1, 4 to 8 in.	40¢	
Washita St., No. 2, 4 to 8 in.	25¢	
Lily White Slips	90¢	
Rosy Red Slips	90¢	
Washita Slips, Extra	80¢	
Washita Slips, No. 1	70¢	
Washita Slips, No. 2	40¢	
India Oil Stones (entire list)		33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit		40%
Quickcut Emery and Corundum Axe Stone, Double Grit		33⅓%
Quickcut Emery Rubbing Bricks		40%
Hindostan No. 1, B'g'lar.	℔ 8¢	
Hindostan No. 1, Small.	℔ 10¢	
Axe Stones (all kinds)		
Turkey Oil Stones, Extra, 5 to 8 in.	℔ 80¢	33⅓%
Queer Creek Stones, 4 to 8 in.	20¢	
Queer Creek Slips	40¢	
Sand Stone	6¢	

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S., ₱ gro. $12.00
Lamoille S. S., ₱ gro. $11.00
White Mountain S. S., ₱ gro. $9.00
Green Mountain S. S., ₱ gro. $6.00
Extra Indian Pond S. S., ₱ gro. $7.50
No. 1 Indian Pond S. S., ₱ gro. $7.00
No. 2 Indian Pond S. S., ₱ gro. $4.50
Leader Red End S. S., ₱ gro. $4.50
Quick Cut Emery, ₱ gro. $10.00
Pure Corundum, ₱ gro. $18.00
} 33⅓%
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%
Electro (Artificial), ₱ gro., $12.00 ..... 33⅓%
Lightning (Artificial), ₱ gro., $18.00 ..... 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ..... ₱ gro. $9.00

Stops— Bench—

Millers Falls ..... 15&10%
Morrill's, ₱ doz., No. 1, $10.00 ..... 50%
Morrill's, No. 2, $12.50 ..... 50%

Door—

Chapin-Stephens Co. ..... 50@50&10%

Plane—

Chapin-Stephens Co. 20%

Straps— Box—

Acme Embossed, case lots..20&10&10%
Cary's Universal, case lots....20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points..doz. 55¢
All Steel Socket...doz. $2.00@2.25
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00 ..... 20%

Stuffers, Sausage—

Enterprise Mfg. Co. ..... 25@25&7½%
National Specialty Co., list Jan. 1 1902 ..... 30&5%
P., S. & W. Co. ..... 40&10&5%

Sweepers, Carpet—

	₱ doz.
Bissell Carpet Sweeper Co.:	
Superba, Crotch Mahogany	$36.00
Triumph, Fancy Veneers	$33.00
Parlor Queen, Fig. Rosewood	$30.00
Elite, Hungarian Ash	$29.00
Am. Queen, Fig. Mahogany	$27.00
Ideal, Bird's-Eye Maple	$25.00
Grand Rapids, Nickel, Japan	$24.00; $22.00
Standard, Nickel, $22.00; Japan	$20.00
Crown Jewel, Nickel, $21.00; Jap.	$19.00
Crystal, Glass Top	$36.00
Grand, 17 in. wide	$36.00
Club, 24 in. wide	$54.00
Hall, 28 in. wide	$60.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks...90&40%
American Cut Tacks.....90&40%
Swedes' Cut Tacks.....90&40%
Swedes' Upholsterers'....90&50%
Gimp Tacks.....90&50%
Lace Tacks.....90&50%
Trimmers' Tacks.....90&40%
Looking Glass Tacks.....65%
Bill Posters' and Railroad Tacks, 90&50&10%
Hungarian Nails.....80&20%
Finishing Nails.....70%
Trunk and Clout Nails...80&10%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks..... 90&5 tens @—%
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.: Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25@30&5%
Steel ..... 33 1-3&5%
Chesterman's ..... 25@25&5%
Keuffel & Esser Co.:
Favorite, Ass. Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin.....40&10@50%
Metallic ..... 30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket ..... 40@40&5%
Steel ..... 33⅓@35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c.....30@33⅓%

Ties, Bale—Steel Wire—

Single Loop.....80&10&5%
Monitor, Cross Head, &c.70&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White..... 20@20&5%

Haying—

Myers' Hay Tools..... 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ₱ doz., Nickel Plated, $1.50; Gold Plated..... $2.00

Saw—

Atkins' Cross Cut Saw Tools....35&5%
Simonds' Improved..... 33⅓%
Simonds' Crescent..... 25%

Ship—

L. & I. J. White..... 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....75&10%
Newhouse ..... 45@45&5%
Hawley & Norton..... 65%
Victor ..... 75@75&10%
Oneida Community Jump..... 50%
Hector ..... 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ₱ doz., $13.25..$11.50 doz.
No. 3, Rat, ₱ doz., $6.50... $5.75 doz.
No. 3½, Rat, ₱ doz., $5.25. $4.70 doz.
No. 4, Mouse, ₱ doz., $3.85. $3.00 doz.
No. 5, Mouse, ₱ doz., $3.00. $2.25 doz.
Oneida Community:
Out o' Sight, Mouse, ₱ doz....$0.60
Out o' Sight, Rat, ₱ doz..... 1.25
Easy Set, Mouse, ₱ doz..... .35
Easy Set, Rat, ₱ doz..... 1.00
Wood Choker, Rat, ₱ doz. holes. .12
Premier Tin Choker, 5 hole, ₱ doz. traps..... .75

Trowels—

Disston Brick and Pointing..... 25%
Disston Plastering..... 20%
Disston "Standard Brand" and Garden Trowels..... 30%
Kohler's Steel Garden Trowels, ₱ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. ₱ gro. $6.00
Woodrough & McParlin, Plastering. 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern..... 50&10%
Western Pattern..... 60&10%
Handy Trucks..... ₱ doz. $16.00
Grocery ..... ₱ doz. $15.00
McKinney Trucks.....each, net $10.00
Model Stove Trucks..... ₱ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.
No. 0 1 2 3
Galvanized $67 $79 $89 $99 10&5%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls.23@25¢
No. 12, ¼ and ½-lb. Balls .21@23¢
No. 18, ¼ and ½-lb. Balls.18@20¢
No. 24, ¼ and ½ -lb. Balls. 17½@19½¢
No. 36, ¼ and ½-lb. Balls. 17@19¢
Chalk Line, Cotton ½-lb. Balls ..... 26@31¢
Cotton Mops, 6, 9, 12 and 18 lb. to doz..... 11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality... 15½@23¢
American 2-Ply Hemp, ¼ and ½-lb. Balls..... 14½@15½¢
American 3-Ply Hemp, 1-lb. Balls ..... 15½@16½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) .10½@11½¢
India 3-Ply Hemp, 1-lb. Balls 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls. 10@11¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls ..... 13½@14½¢
Mason Line, Linen, ½-lb. Bls.47¢
No. 264 Mattress, ¼ and ½-lb. Balls, according to quality. 30@60¢
Wool, 3 to 6 ply....B 9¢; A 10¢

Vises—

Solid Box.....50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable..... 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel..... 25%
Star, Solid Jaw..... 40%
Hollands':
Machinists' ..... 40@40&5%
Keystone ..... 65&5@70%
Lewis Tool Co.:
Adjustable Jaw..... 30%
Monarch, 50%; Solid Jaw..... 50%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip.....15%
Merrill's 20%
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25%; Regulars.....20@25%
Vulcan's ..... 40@45%
Combination Pipe..... 55@60%
Prentiss ..... 20@25%
Rock Island 25%
Snediker's X. L. 33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ₱ doz., $24.00, 30%; Clamps..... 30%
Perfection Saw Clamps, ₱ doz....$4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25%
Star 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe..... 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870 40%.
Rock Island Pipe..... 25%

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10..... 1.25
P. E., 8..... 1.50
P. E., 7..... 1.50
} *Dis. 15%*
Ely's B. E., 11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled .....45&10%
Ground .....50&5%
Plain or Unground.....60%
Country Hollow Ware, per 100 lbs. $3.00
White Enameled Ware:
Maslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....35&10%
Enameled .....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware..... 33⅓%
Iron Clad Ware..... 70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles..... 60%
Porcelained ..... 50&5@50&10%
Never Break Spiders and Griddles. 65&5%
Never Break Kettles..... 60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles..... 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc:	₱ doz.
Crescent, family size, bent frame	$4.05
Red Star, family size, stationary protector	$4.05
Double Zinc Surface:	
Saginaw Globe, family size, stationary protector	$3.55
Cable Cross, family size, stationary protector	$3.60
Single Zinc Surface:	
Naiad, family size, open back, perforated	$3.00
Single Saginaw Globe	$2.85
Brass Surface:	
Brass King, Single Surface, open back	$4.05
Nickel Plate Surface:	
No. 1001 Nickel Plate, Single Surface	$3.60
Glass Surface:	
Glass King, Single Surface, open back	$3.95
Enamel Surface:	
Enamel King, Single Surface, ventilated back	$3.95

Washers—Leather, Axle—

Solid .....90@90&10%
Patent .....90@90&5%
Coil: ⅞ 1 1⅛ 1¼ Inch.
9¢. 10¢. 11¢. 14¢. per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$4.90 4.00 2.70 2.50 2.0
The above prices are based on $6.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¼@2¢

Wedges—

Oil Finish.....lb., ..@3¢

Weights—Hitching—

Covert Mfg. Co. ..... 30&2%

Sash—

Per net ton, f.o.b. factory:
Eastern District...$25.00@$28.00
Southern Territory.$22.00@$24.50
Western and Central Districts .....$22.50@$23.50

Wheels, Well—

8-in., $2.00; 10-in., $2.45; 12-in., $3.25; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....72&10&7½%
10 to 18.....72½&10&10%
19 to 26.....75&10&10&2½%
27 to 36.....77½&7½%
Galvanized:
6 to 9.....72½&10%
10 to 14.....72½&10&5%
15 to 16.....72½&10&5%
17 to 18.....72½%
19 to 26.....70&5&2½%
27 to 36.....65&10&10%
Coppered:
6 to 9.....65&10&10%
10 to 14.....70&10&5%
15 to 18.....65&10&10&10%
19 to 26.....70&5&2½%
27 to 36.....72½&10&2½%
Tinned:
6 to 18.....67&10&10%
Brass .....17¼¢ lb., base
Copper .....32¢ lb., base
Cast Steel Wire..... 50%

Spooled Wire—

Annealed and Tinned, 70&10&10&10%
Brass and Copper...60&10&10&10%
Retailers' Assortments, per box, $2.10@$2.40
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods.....90&25@—%
Brass Wire Goods....90@90&10%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&2½@80&7½%
Painted Screen Cloth, 100 ft., $1.35
Standard Gale, Hardware Grade: Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh....$2.75
Nos. 4 and 5 Mesh.....$3.00
No. 6 Mesh.....$3.25
Nos. 7 and 8 Mesh.....$3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural .....80&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme ..... 60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut..... 50%
Combination Black..... 40&5%
Merrick Pattern..... 50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Donohue's Engineer..... 40&10%
Eagle 70%
Gem Pocket..... 50%
Hercules 10%
W. & B. Machinist:
Case lots..... 50&5%
Less than case lots..... 50%
W. & B. Railroad Special:
Case lots..... 50%
Less than case lots..... 40&10&5%
Solid Handles, P., S. & W., 50&10%; full cases..... 50&10&5%
Stillson 65%
Uwanta Wrench Co.:
Uwanta Special, Iron Handle, 40&10&5%
Other Wrenches..... 50%
Vulcan and Agrippa Chain..... 50%
Whitaker Machinists':
Case lots..... 50&10%
Less than case lots..... 50%

Wrought Goods—

Staples, Hooks, &c., list March 17, '92.....85&10&10%

Zinc— *(Cask lots at mill.)*

Sheet.....per 100 lb., $7.00

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1½ in. round and square	₩ lb 2.00¢
1½ to 4 in. x ⅜ to 1 in.	₩ lb 2.00¢
1½ to 4 in. x ¼ to 5-16	₩ lb 2.20¢
Rods—⅜ and 11-16 round and square	₩ lb 2.20¢

Angles:

	Cts ₩ lb
3 in. x 1¼ in. and larger	2.40¢
3 in. x 3 16 in. and ¼ in.	2.65¢
1½ to 2½ in. x ⅛ in.	2.45¢
1½ to 2¾ in. x 3-16 in. and thicker	2.40¢
1 to 1¼ in. x 3-16 in.	2.45¢
1 to 1¼ x ⅛ in.	2.50¢
⅝ x ⅛ in.	2.65¢
¾ x ⅛ in.	2.75¢
⅝ x ¼ in.	3.10¢
½ x 3-32 in.	4.30¢

Tees:

1 in.	2.75¢
1¼ in.	2.55¢
1½ to 2½ in.	2.45¢
3 in. and 4 larger	2.40¢
Beams	2.40¢
Channels, 3 in. and larger	2.40¢
Bands—1½ to 6 x 3-16 to No. 8	2.15¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
"Ulster"	3.10¢
Norway Bars	5.50¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	2.10¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, C.R. Soft Steel.	R. G. Cleaned.
No. 14	₩ lb 2.85	3.10¢
Nos. 18 to 21	₩ lb 2.95	3.10¢
No. 27	₩ lb 3.15	3.40¢
No. 28	₩ lb 3.20	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment, W. Dewees Wood	₩ lb 11¾@14½¢
Patent Planished	₩ lb A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16	₩ lb, 3.15¢
Nos. 22 to 24	₩ lb, 3.55¢
No. 27	₩ lb, 4.00¢
No. 28	₩ lb, 4.25¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:	
IC, 14 x 20	$6.40
IX, 14 x 20	7.65
A. Charcoal:	
IC, 14 x 20	$5.45
IX, 14 x 20	6.55

American Coke Plates—Bessemer-

IC, 14 x 20 ..... 107 lb	$4.45
IX, 14 x 20	5.45

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8 60
IX, 20 x 28 with an 8 lb. coating	10.60

Seamless Brass Tubes—

List December 4, 1905. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List December 4, 1905. Base price 18¢

Copper Tubes—

List December 4, 1905. Base price 21¢

Brazed Brass Tubes—

List June 6, 1898. 20¾¢ ₩ lb

High Brass Rods—

14½¢ ₩ lb

Roll and Sheet Brass—

List June 6, 1898. 14½¢ ₩ lb

METALS—

Tin—

Straits Pig	₩ lb 34 @35 ¢

Copper—

Lake Ingot	₩ lb 14 @14¼¢
Electrolytic	₩ lb 14 @14¼¢
Casting	₩ lb 13⅝@13¾¢

Sheet Copper Hot Rolled, 16 oz	₩ lb 17@..¢
" " " 14 "	" " 18@..¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ advance over Cold Rolled.
Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.

Bottoms, Pits and Flats	₩ lb 21¢ basis
Planished Copper, 1¢ ₩ lb more than Polished.	

Spelter—

Western	₩ lb 5½@6 ¢

Zinc.

No 9, base, casks, ₩ lb 7.50¢ | Open	₩ lb 8.00¢

Lead.

American Pig	₩ lb 4½@5 ¢
Bar	₩ lb 5½@6 ¢

Solder.

½ & ½, guaranteed	₩ lb 22 @22½¢
No. 1	₩ lb 19½@20½¢
Refined	₩ lb 17½@18 ¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb ..@12¢
Hallett's	@11¢
Other Brands	@10¢

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:

Small lots	38¢
100-lb lots	36¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy and Wire	₩ lb 11.00@11.50¢
Copper, Light and Bottoms	₩ lb 10.25@10.50¢
Brass, Heavy	₩ lb 8.00@ 8.50¢
Heavy Machine Composition	₩ lb 10.25@10.50¢
Clean Brass Turnings	₩ lb 6.75@ 7.25¢
Composition Turnings	₩ lb 8.00@8.5..¢
Lead, Heavy	₩ lb ...@ 3.40¢
Tea Lead	₩ lb ...@ 3.15¢
Zinc Scrap	₩ lb ...@ 3.00¢
No. 1 Yard Wrought, Long	$....@ 11.00
No. 1 Yard Wrought, Short	$....@10.00
Wrought Pipe	$....@ 9.00
No. 1 Machinery Cast	$11.25@12.25
Stove Plate	$....@11.50

THE IRON AGE

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